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# Updating in Parallel under Threat: Cues, Emotions, Frames, and Memories

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*For Marina and my family, Nikos, Christianna, and Athena.*



## **ABSTRACT**

### **Updating in Parallel under Threat: Cues, Emotions, Frames, and Memories**

**George Nicholas Georgarakis**

This dissertation proposes a theoretical framework of attitude change under threatening conditions based on parallel updating. More specifically, I focus on public preferences for policies to address terrorist attacks, pandemics, climate change and natural disasters in periods when these threats are elevated. I test my argument with four original survey experiments, which include eleven interventions and draw on a nationally diverse sample of a total of 9,110 American citizens. These interventions identify the effects of factual information, partisan cues, incidental emotions, ideological and non-ideological framing, and memory priming.

Evidence from these experiments provides consistent support that public opinion updating exhibits five characteristics. First, citizens change their views by a small amount. Second, citizens' opinions move in the direction of information. Third, attitude change occurs regardless of political predispositions and individual attributes. Fourth, exposure to information about a specific policy area does not impact preferences for policies unrelated to this area. The only exception to this rule is when the treatment is emotionally strong. Finally, attitude- and identity-based cross pressures may introduce only minimal bias in the manner citizens update their opinions.

These conclusions strongly challenge theories of public opinion which argue that individual differences in more-or-less enduring political and psychological characteristics can lead to political polarization. Although the persuasive techniques studied here are not equally potent in changing political views, the findings invite cautious optimism about the capacity of citizens to update opinions in a reasonable and accurate manner, even when the circumstances are unfavorable. Finally, the results suggest that the roots of polarization should be searched for more directly, notably in the increasingly fragmented political, social, and media environments.

**Key words:** Public opinion, attitude change, cues, emotions, framing, memories

## RESUME DE LA THESE

Cette thèse propose un cadre théorique pour le changement d'opinion dans des contextes de menace. Ce cadre théorique est basé sur l'hypothèse d'une « actualisation en parallèle ». Plus précisément, je me concentre sur les préférences du public pour les politiques en réponse aux attaques terroristes, aux pandémies, au changement climatique et aux catastrophes naturelles dans les périodes où ces menaces sont élevées. Je teste mon argument avec quatre expérimentations originales dans des enquêtes d'opinion en population générale. Ces quatre expérimentations représentent onze interventions et s'appuient sur un échantillon nationalement diversifié d'un total de 9110 citoyens américains. Ces interventions identifient les effets des informations factuelles, des indices partisans, des émotions incidentes, du cadrage idéologique et non idéologique, et de l'amorçage de la mémoire.

Les preuves tirées de ces expériences confirment systématiquement que l'actualisation de l'opinion publique présente cinq caractéristiques. Premièrement, les citoyens changent d'avis de manière limitée. Deuxièmement, les opinions des citoyens se meuvent dans le sens de l'information. Troisièmement, le changement d'opinion se produit indépendamment des prédispositions politiques et des attributs individuels. Quatrièmement, l'exposition à des informations sur un domaine politique spécifique n'affecte pas les préférences pour les politiques qui ne se rapportent pas à ce domaine. La seule exception à cette règle est lorsque le traitement est émotionnellement fort. Enfin, le poids des pressions croisées basées sur les attitudes et l'identité ne devrait introduire qu'un biais minimal dans la façon dont les citoyens actualisent leur opinion.

Ces conclusions remettent fortement en question les théories de l'opinion publique qui soutiennent que les différences individuelles dans les caractéristiques politiques et psychologiques plus ou moins durables peuvent conduire à une polarisation politique. Bien que les techniques de persuasion étudiées ici ne soient pas tout aussi puissantes, les résultats invitent à un optimisme prudent quant à la capacité des citoyens à actualiser leurs opinions de manière raisonnable et précise, même lorsque les circonstances sont défavorables. Enfin, les résultats suggèrent que les causes profondes de la polarisation devraient être recherchées plus directement, notamment dans les environnements politiques, sociaux et médiatiques de plus en plus fragmentés.

**Mots clés :** Opinion publique, changement des comportements, signalement, émotions, cadrage, mémoires



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# INTRODUCTION

## Why Public Opinion Is Not as Bad as We Think

Imagine sitting around the family table. The whole family is there to celebrate a special occasion. You are wearing your fancy clothes and you are glad that you are catching up with loved ones. Suddenly, your old uncle starts talking about how this crazy world makes him feel stressed and confused. The family around him nods in agreement and starts discussing all the terrible things that 2020 brought, the pandemic, the extremely active hurricane season, and the dangers of domestic and international terrorism. Some disagree on which issue is most important, others are completely indifferent but they all sound exasperated... Soon enough, the family table is divided on what is going wrong and whose fault it is. Younger and more progressive family members complain about the systemic deficiencies that endanger our future, while older folks observe that the current system is the only thing that prevents us from descending into complete chaos.

You want to help them see a light at the end of the tunnel. What should you do? Should you stay quiet, let them finish their discussion, and move on to a more pleasant topic? Should you express your opinion and offer evidence that supports it? Will this conversation lead them to change their mind or will they stand their ground more firmly and become even more divided? The research presented suggests that it is worth the effort to engage with the arguments of your family constructively. Most probably, they will not abandon their views entirely but, if you

carefully use certain persuasive techniques, on average they will all move a little toward the direction of evidence regardless of their general beliefs.

This thesis presents an extended argument about how citizens update their political opinions under threatening conditions. I propose that when citizens are exposed to new information, they change their attitudes in a reasonable manner, that is in small increments, in the direction of information, and in parallel (irrespective of their background characteristics). Attempts to persuade citizens about a specific policy issue rarely have an impact on citizens' attitudes toward other policy areas – but strong emotional appeals can be more effective in this regard than factual information. Overall, I argue that, as a rule, ordinary citizens are fairly predictable and may exhibit minimal bias only when messages directly contradict their political identities and values.

This argument contradicts many popular accounts of public opinion, which describe the individuals as uninformed, inattentive, and biased (Downs 1957; Hastorf and Cantril 1954). For decades, scholars and pundits have repeatedly expressed their concern about whether citizens are competent enough to support and advance liberal democracy through an organized party system and electoral competition (e.g., Schumpeter 1943; Key 1964). This negative view of public opinion has been employed to underline the need for elites and leadership in democratic politics and to justify their privileged role. While recent research shows that the capacity of elites to be unbiased may be overestimated (e.g., Broockman and Skovron 2018), this thesis aims to provide evidence that the quality of opinions held by the public is also systematically underappreciated.

To analyze attitude change, I apply a political psychological approach to public opinion (Huddy, Sears, and Levy 2013). This epistemological choice carries a particular view of methodological individualism (Arrow 1994). Rather than making unwarranted and unrealistic assumptions about the rationality of individuals, my starting point is that citizens' perceptions

about and involvement in politics are influenced by their political considerations, emotions, identities, and values. To investigate how citizens understand their political environment and respond to it, I conduct four experimental studies, which include eleven interventions. These interventions identify the effects of elite cues, factual information, incidental emotions, ideological and non-ideological framing, and memory priming.

The skepticism surrounding public opinion started well before its systematic examination and continues uninterrupted despite conflicting evidence. In *The Republic*, his most famous work, Plato was one of the first western philosophers to express his disregard for citizens' ability to govern themselves. He argued that a majority of citizens is simply too ignorant to be trusted with important decisions and that a good polity should be ruled only by philosophers. People with little knowledge should either obey or educate themselves to become wise and participate in the democratic decision-making process. Flash forward 2300 years later, or so, many of these thoughts are echoed in Walter Lippman's work on public opinion ([1922] 2007; [1925] 1993). Indeed, Lippman was a staunch critic of public opinion suggesting that the concept described nothing more than a muddle of gut feelings and uneducated guesses. A similar pessimism is shared by Bourdieu (1979), who went so far as to claim that public opinion does not exist in reality.

However, even if public opinion is but a social construction, it must exhibit certain attributes and characteristics. A considerable strand of the literature paints a gloomy picture. A great deal of ink has been devoted on how inconsistent (Converse 1964), unaware (Zaller 1992), biased (Lodge and Taber 2013), and capricious (Achen and Bartels 2016, Chapter 5) public opinion is. The common ground of these seminal works is that citizens know little about politics, they care even less to learn, and they are inherently motivated to confirm their prior beliefs regardless of facts. Interestingly, all these theoretical accounts are essentially similar in their

predictions and interpretations, despite the fact that they draw on evidence that covers a long period of time during which the constituent foundations of public opinion, such as the media environment and the structure of partisan competition, have dramatically changed.

Nevertheless, these views have not gone unchallenged. The most convincing counterargument comes from the “miracle of aggregation.” First introduced by Sir Francis Galton (1907a; 1907b; for an extension of the argument, see Surowiecki 2005; for a qualification of the argument, see Marquis de Condorcet 1785), the miracle of aggregation states that, even if citizens are uninformed about politics and favor extreme options at the individual level, when their opinions are aggregated, their random errors cancel out and their average preferences are both accurate and moderate. V.O. Key Jr. makes a similar point when he proclaims that “voters are not fools,” unless their political leaders misguide them (Key 1966, 2; see also Berelson, Lazarsfeld, and McPhee 1954, Chapter 10). Likewise, in *The Rational Public*, Page and Shapiro (1992) find that Americans as a collectivity express understandable and consistent opinions about a great variety of policy issues and across five decades.

These insights invite optimism about the competence of the citizenry to participate in the democratic project. In fact, the average American seems to have many beneficial qualities that modern democracies need in order to survive and even thrive: although she may have some blind spots, she is pretty reasonable, and although her preferences are stable, they are still malleable to a degree that can maintain democratic and electoral competition. From a normative point of view, these are exactly the characteristics one would like to observe in a democratic public as strong-mindedness or complete ignorance represent serious intellectual deficits in the liberal public sphere. An important caveat is in order. The American public seems to be reasonable in the way it updates its opinions but not necessarily with regard to the content of its opinions. The latter largely

depends on the quality of the available information or information environment, including the content of the information and efforts at persuasion by leaders.

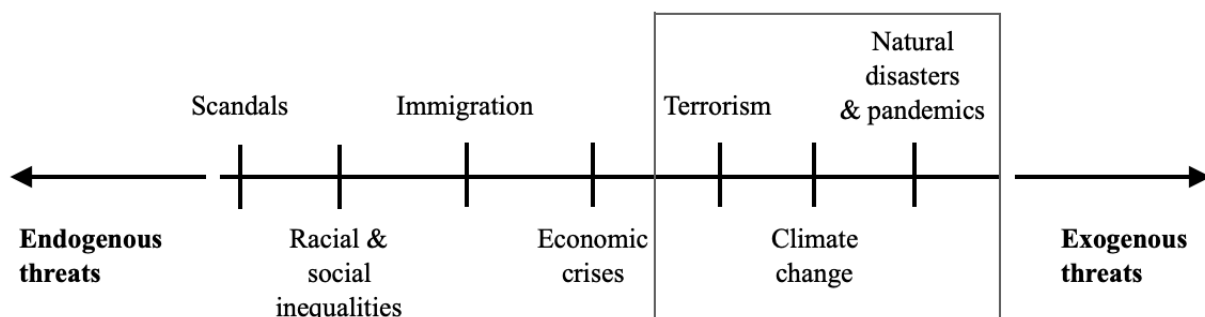
A competent public can prove its value especially in times of crisis. After 9/11, the relative prosperity of the 1990s and the decades that immediately preceded gave its place to a perpetual alternation between potential risks and actual threats that challenge not only our democratic coexistence but also our very existence (for the relationship between modernity and risk, see Beck 1992). The emergence of modern societies that are organized in response to risk calls into question many constants of the democratic system and the role of public opinion in it. Is public opinion predictable enough in an environment of ever-growing uncertainty? Can people change their opinions in a meaningful fashion even when their world is overwhelmed with ambiguity? Can we trust that citizens are still able to perform their democratic duties as social change becomes the only constant of our political systems?

In this thesis, I study attitude change in different contexts that are characterized by a high level of threat. In such times, citizens' perceptions of risk increase and they respond with intense fear, anger, and disgust (Lerner and Keltner 2001; Clifford and Jerit 2018). More precisely, I focus on three types of threat that are relatively exogenous: terrorism, the COVID-19 pandemic, and climate change and natural disasters. These threats are exogenous in that the principal threatening agent is not the government but some alien source (Huddy et al. 2002). However, in a globalized and increasingly complicated and interconnected world, threats cannot fit perfectly in a binary categorization of endogenous and exogenous crises.

Figure 1 presents a continuum of endogeneity and exogeneity of threats and suggests indicative positions for a series of major threats that have beset the U.S. for many decades. In this continuum, scandals (political or otherwise) are considered as the most endogenous threats because

the violation of norms is usually associated with negligence or wrongdoing on the politicians' side. Further, racial and social inequalities are long embedded in American culture and society and are endogenous to the way the political system works. Despite its connection with existing systemic inequalities, immigration is somewhat more exogenous in that immigration flows are often dependent on conditions that exist in foreign countries and their domestic politics. Finally, economic crises represent a more ambiguous case of threats as the U.S. is a key player in the globalized market and has a decisive power in influencing economic outcomes at the national level.

Figure 1. A continuum of endogeneity and exogeneity of threats



Focusing on relatively exogenous threats provides a hard test on the argument of this thesis for two reasons. On the one hand, in the wake of such threats political elites are not held accountable for actively triggering a crisis but for not being sufficiently prepared to deal with it adequately.<sup>1</sup> Because accountability is blurred in the wake of such crises, a wide but short-lived

<sup>1</sup> The increasing impact of misinformation is challenging this view. Indeed, many of the most popular conspiracy theories seek to endogenize the origins of exogenous threats. Recent examples



consensus may be formed that increases the government's room to maneuver (Mueller 1973; Brody 1991). On the other hand, information asymmetries increase after an exogenous shock and elites can manipulate public perceptions of the crisis independent of the actual nature of the crisis (Entman 2003; Baum and Groeling 2010; Hellwig 2014). If citizens are still able to update their opinions in an understandable and predictable fashion even under these adverse conditions, then pessimistic concerns about their capacity to be reasonable should be tempered.

The argument of the thesis extends beyond these specific cases as I examine a wide range of drivers of attitude change. Across four chapters I test the effectiveness of an equal number of techniques in generating attitude change: cueing, emotional manipulation, framing, and priming. These techniques are commonly used in everyday politics and, with the exception of emotions (but see for example, Valentino et al. 2011; Clifford and Jerit 2018), their effects have been extensively studied in the literature of public opinion (Bakker, Lelkes, and Malka 2019; Brader, Valentino, and Suhay 2008; Chong and Druckman 2007; 2013; Iyengar and Kinder 2010). Further, the experimental interventions vary in their intensity and intent to persuade. Some treatments are rather short and intend to sway public opinion (Chapter 1) whereas others do not aim to be explicitly persuasive (Chapter 4). Likewise, some interventions are designed to be emotionally strong (Chapter 2) and others are rich with factual information (Chapter 3).

Although this thesis restricts its focus on the American case, careful generalizations can be made. My interest in the American public stems from the fact that the U.S. has enjoyed uninterrupted, though not universal, democracy for almost 250 years and is currently experiencing

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are the theory that the 2020 wildfires in California were incited by “powerful lasers” or that the SARS-CoV-2 virus that caused the COVID-19 pandemic was intentionally released from a lab.

a strong democratic backlash. Many of the challenges that American citizens have been through (e.g., terrorism, natural disasters, epidemics) serve as precursors of the crises that the rest of the Western world has been facing. Importantly, I do not think about the U.S. as an exceptional case. Other Western European or Anglo-Saxon countries can benefit from experiences in the U.S. insofar as they adapt these lessons to their own political environment and civic culture. In general, I expect that emotional manipulation, ideological framing and other topics examined in this thesis will work similarly outside the U.S., but the validity of this expectation rests on future research in these countries.

This thesis aims to make several contributions to the fields of political science and political psychology. First, I analyze many constituent aspects of attitude change that have rarely been studied together and explained in a coherent theoretical framework. The literature on attitude change is vast but fragmented. There are separate investigations about its magnitude (e.g., Coppock, Hill, and Vavreck 2020), its direction (e.g., Byrne and Hart 2009; Guess and Coppock 2018), its heterogeneity (e.g., Drummond and Fischhoff 2017), its spillover potential (e.g., Hopkins and Mummolo 2017), and its dependence on attitude-based and group-based cross-pressures (e.g., Luong, Garrett, and Slater 2019; Mason 2018). To make things worse, prominent frameworks that propose a structure to these findings (e.g., Zaller 1992; Lodge and Taber 2013) have recently been put into question (e.g., Druckman and McGrath 2019). This thesis aims to contribute to the ongoing efforts to re-examine the nature and dynamics of public opinion under a new theoretical lens and with the use of methodologically sound approaches.

Second, I provide evidence about how attitude change occurs in critical but also realistic contexts. Modern societies increasingly deal with multiple and asymmetric threats that represent severe risks for individuals (Friedman 2018) and communities (Beck 1992). The study of critical

events (e.g., terrorist attacks, pandemics, natural disasters) is crucial because they are no longer the exception, but the rule. As climate change worsens, weather anomalies tend to happen more frequently (Knutson et al. 2018), viruses are transmitted more easily (Cavicchioli et al. 2019), and living conditions in many parts of the globe become harder (Konapala et al. 2020). In a globalized world, these pressures amplify systemic inequalities and threaten the fragile fabric that keeps liberal societies together. Importantly, an advantage of the research presented in this thesis is that I analyze public responses to threats in realistic contexts. Indeed, all the experiments were conducted in the wake of real-world crises, and thus track attitude changes as they actually occur. This increases the external validity of the research design and adds additional confidence to the results.

Third, I investigate the impact of four widely used techniques that stimulate attitude change. Partisan cueing, emotional manipulation, ideological and non-ideological framing, and memory priming are often employed to appeal to the hearts and minds of citizens and secure their support for public policies and candidates. Instead of providing short messages that only convey dry, factual information and do not resemble the kind of media content consumed by ordinary citizens, the treatments I designed differ in their intensity, obtrusiveness, and intention to persuade. The richness of these experiments can help unravel the driving forces of attitude change and propose interventions that work in real life.

Finally, I use experimental methods to identify the causes of attitude change. Much of the relevant literature suffers from biases related to the observational nature of the data it draws on. More specifically, inverse causation and omitted variable bias can undermine the validity of causal claims and lead to misleading conclusions about the dynamics of public opinion. In contrast, experimentation can overcome these problems in a methodologically reliable way. Randomly

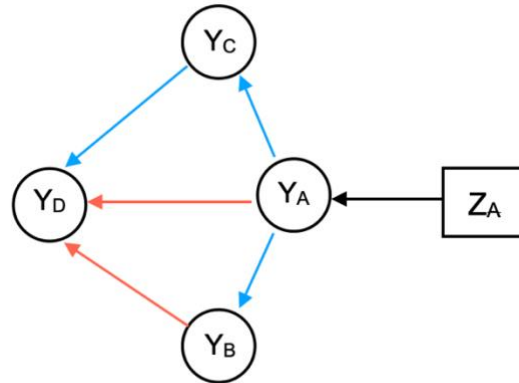
assigning subjects to treatments reinforces the internal validity of the studies and allows me to examine the causal effect of specific experimental interventions on public attitudes toward policy issues. In all survey experiments included in this thesis, I leverage randomization and use large nationally diverse samples of Americans to test the validity of my main argument and draw credible conclusions.

## **THEORETICAL FRAMEWORK**

This section aims to offer a primer on the general theoretical framework I employ in the following chapters. Each chapter further elaborates on this framework and introduces nuances in the study of attitude change that are not presented here. However, before focusing on attitude change, one should first understand how attitudes are organized.

I conceptualize belief systems as a network of interconnected idea-elements (see Figure 2). In this framework, preferences, beliefs, attitudes, and other idea-elements are the interconnected nodes of the network (see Brandt and Sleegers (in press) who present a theoretical evaluation of a similar argument). Each of these nodes has three facets (Allport 1954). The first component is the cognitive component, which denotes what individuals know about a certain policy issue, group, or candidate. The second is the affective component that includes evaluations on how citizens feel about what they know. The last component of attitudes contains information about how individuals behave given their knowledge and evaluations.

Figure 2. Exogenous impact on the structure of belief systems



*Note:  $Y_A$  to  $Y_D$  indicate considerations  $Y$  about objects  $A$  through  $D$ , i.e. attitudes that compose an individual's belief system. Accordingly,  $Z_A$  is an exogenous intervention that affects  $Y_A$ . Positive links are colored in blue while negative links are colored in red.*

The analysis of belief systems has long been the subject of fervent research and scholarly debate because they affect the political and non-political considerations of citizens and elites. Belief systems impose a structure on the various preferences, opinions, beliefs, attitudes,<sup>2</sup> values,

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<sup>2</sup> Beliefs are conjectures about the state of the world while attitudes are enduring predispositions to respond to a class of stimulus objects. Although this distinction is theoretically important, it is hard to empirically differentiate between beliefs and attitudes using survey instruments (Zaller 1992). For this reason, I use the terms interchangeably when opinions are measured with a single item. However, when I create additive scales of items I refer to them only as attitudes (for a critique of additive scales as measurement instruments see Broockman 2016; cf. Ansolabehere, Rodden, and Snyder 2008).

traits, and identities possessed by individuals. The manner in which these idea-elements are related exhibits different degrees of consistency (Converse 1964), complexity (Roccas and Brewer 2002), and sophistication (Luskin 1987). The general public's belief system influences attitudes toward democracy (e.g., Welzel and Inglehart 2009; Dalton 2019), political participation (e.g., Mayer 2010), terrorism (e.g., Hetherington and Suhay 2011), climate change (e.g., Karol 2019), pandemics (e.g., Gollwitzer et al. 2020), redistribution (e.g., Johnston, Lavine, and Federico 2017), and immigration (e.g., Thomsen, Green, and Sidanius 2008), among other things. Accordingly, the content of the elites' belief system is associated with their (mis)perceptions of public opinion (e.g., Broockman and Skovron 2018), their capacity to represent their constituents (e.g., Ahler and Broockman 2018), and roll call voting in Congress (e.g., Poole and Rosenthal 2000).

This conceptualization of belief systems is based on three assumptions (Brandt and Sleegers in press). First, as the term *belief system* implies, attitudes are fixed but also related to one another. This assumption parallels Converse's definition of belief systems as "a configuration of ideas and attitudes in which the elements are bound together by some form of constraint or functional interdependence" (Converse 1964, 3; see also Gerring 1997; Jost 2006). Second, attitudes are interdependent and the links between attitudes are causal. Converse refers to this interdependence as "constraint" and predicts that a dynamic view of this constraint entails that changes in a specific idea-element should influence other idea-elements of the system. The third assumption is that exogenous factors (e.g., facts, affective information) can affect the structure and/or the content of a belief system. In other words, conditional on exposure, receiving messages from outside the system influences the content of citizens' opinions and how they are related to one another.

Attitudes can change when either their cognitive or affective component is exogenously manipulated. For example, presidential addresses to the nation in the wake of terrorist attacks increase public preferences for counterterrorism (Norris, Kern, and Just 2003; Kuypers 2006), emotions shape attitudes toward epidemics (Albertson and Gadarian 2015), climate anomalies affect environmental concerns (Ripberger et al. 2017), and op-eds can change citizens' minds about various policy issues (Coppock and Green in press).

How the structure of belief systems relates to attitude change has been the subject of vigorous scholarly debate. Converse (1964) suggests that it is harder for ideologues, i.e., citizens whose belief systems exhibit high constraint, to be convinced to switch positions. In contrast, individuals whose issue positions are less correlated can change their opinions on the basis of their group identification or the fortunes and misfortunes of political life. Zaller (1992) challenges the monotonic relation between the structure of beliefs and the effects of information on policy preferences. Instead, he posits that persuasion depends on the structure of communication flows and it is people who are moderately aware about political issues that are more receptive to persuasion (for a more detailed discussion, see Chapter 1).

This thesis explores the nature and dynamics of attitude change. More specifically, I study the magnitude, direction, homogeneity, spillover potential, and attitude-based and group-based cross-pressures that characterize attitude change. The literature of public opinion offers conflicting evidence about how citizens update their opinions. Some researchers find that attitude change is minimal and occurs as a function of citizens' awareness and/or priors (e.g., Klapper 1960; Coppock, Hill, and Vavreck 2020) while others theorize that attitudes can fluctuate considerably (e.g., Lasswell [1927] 2013). Likewise, certain scholarly works show that different subgroups of the population change their views in distinctive ways that can lead even to boomerang or backfire

effects (e.g., Lodge and Taber 2013; Byrne and Hart 2009), whereas others demonstrate that background characteristics do not affect the magnitude and direction of attitude change (Page and Shapiro 1992).

Similar disagreements exist about spillover effects and attitude-based and group-based cross-pressures. Although Converse (1964) predicts that changes in one attitude should result in changes in other attitudes contingent on the dynamic constraint of belief systems, there is little empirical evidence that spillover effects occur (Hopkins and Mummolo 2017; Coppock and Green in press). Findings about more complex phenomena, such as cross-pressures, are even more conflicting. Cross-pressures describe the psychological tensions that are generated by holding incongruent attitudes or belonging to opposing social groups (e.g., Roccas and Brewer 2002). In these cases, research suggests that some identities may prevail over others (e.g., Klar 2013) or that diverging considerations may neutralize one another under certain conditions (e.g., Druckman 2004). To reduce these pressures, scholars recommend appealing to superordinate identities or tailoring messages to the ideological characteristics of the target audience (e.g., Levendusky 2017; Luong, Garrett, and Slater 2019).

To analyze attitude change I draw on three theories of public opinion, the Bayesian Learning Model, Zaller's Receive-Accept-Sample (RAS) model, and motivated reasoning. These theories provide different and often contradictory insights into what forces drive citizens to update their views. In each chapter, I present a set of conflicting hypotheses deriving from these approaches and empirically test their validity.

The most fundamental disagreement among these theories relates to the motivations that underlie attitude change, its expected direction and heterogeneity. On the one hand, motivated reasoning and the RAS model offer compatible expectations about attitude change. Theories of



motivated reasoning posit that, when exposed to new information, citizens are directionally motivated to confirm their preexisting beliefs (Kunda 1987; 1990). The RAS model articulates a similar hypothesis but puts the emphasis on the role of political awareness. On the other hand, parallel updating, as described in the parallel publics thesis (Page and Shapiro 1992) and the Bayesian Learning Model, proposes that citizens are motivated to be accurate and update their opinions in a reasonable fashion when they encounter messages from credible sources. What makes it hard to test the validity of each theory is that citizens tend to find credible the same sources with whom they share common values and identities (Druckman and McGrath 2019).

Motivated reasoning includes many theories, which underscore the importance of political predispositions and identities (Wong-Parodi and Feygina 2020). These accounts emphasize the role of social and political identities (Taber and Lodge 2006), worldviews (Kahan, Jenkins-Smith, and Braman 2011) and system justification (Feygina, Jost, and Goldsmith 2010) in motivating directional goals. Motivated reasoning manifests itself in three biases (Lodge and Taber 2013). First, individuals may exhibit confirmation bias if they search for information that confirms their prior beliefs. Second, biased assimilation occurs when individuals place greater weight on messages consistent with their preexisting beliefs and little weight on information that contradicts them. Third is disconfirmation bias, where citizens spend more time and effort to argue against information contrary to their predispositions. In extreme cases, disconfirmation bias may generate boomerang or backfire effects and lead individuals to update their opinions in the opposite direction of the evidence they receive (Byrne and Hart 2009; Hart and Nisbet 2012)

The RAS model supports similar predictions but highlights the moderating effect of political awareness (Zaller 1992). More specifically, the model is based on four axioms. The Reception Axiom posits that the higher a citizen scores in political awareness, that is her level of

cognitive engagement with an issue, the more likely she is to receive political information about this issue. The Resistance Axiom suggests that if citizens receive political messages that are inconsistent with their prior beliefs, they will resist them contingent on whether they are knowledgeable enough to detect this inconsistency. Finally, the Accessibility and Response Axioms state that people can readily retrieve considerations that have been recently called to mind and then average across these considerations to answer survey questions. These two last axioms are particularly relevant for the rarity of spillover effects. Indeed, priming individuals to think about a specific issue may cause them to think less about other issues, thus decreasing their dynamic constraint and their probability to report changes in irrelevant attitudes (for a more detailed discussion of the RAS model, see Chapters 1 and 2).

Contrary to these theories, parallel updating hypothesizes that individuals and collectivities as political actors hold more or less reasonable opinions and update them regardless of their background characteristics. At the aggregate level, this argument has been developed by Page and Shapiro (1992). In their seminal work *The Rational Public*, Page and Shapiro study the preferences of the American public on 169 policy issues from the 1930s to the early 1990s and find that it has relatively stable positions over time. Importantly, Americans as a collectivity change their policy preferences in light of new information and in parallel, irrespective of their gender, race, education, occupation, income, religion, age, partisanship, region, and community.

At the individual level, the parallel publics thesis is consistent with the Bayesian Learning Model. Although the Bayesian Learning Model is compatible with many, and often conflicting, hypotheses depending on the likelihood function, the model stipulates that citizens update their opinions by adjusting their prior beliefs in accordance with the relative credibility of new evidence

they encounter (Druckman and McGrath 2019).<sup>3</sup> In other words, Bayesians are motivated to form accurate opinions and change them in a sensible manner (Gerber and Green 1999). Indeed, findings suggest that citizens update their views about policies (Bullock 2011) and climate change (Ripberger et al. 2017) according to the Bayes' rule and exhibit little political bias when processing new information (Hill 2017),.

## **RESEARCH APPROACH**

To test the central argument of the thesis, I conduct four randomized experiments, which include a total of eleven interventions. Randomized experiments or randomized control trials are often thought of as the “gold standard” of research designs because they demonstrate cause-and-effect relationships between treatments and outcomes in an unbiased manner (Gerber and Green 2012). Indeed, drawing causal inferences from observational research often requires heroic and unverifiable assumptions about the existence of unobserved heterogeneity and the independence of the error term. In contrast, where possible, randomized experiments satisfy these assumptions by design.

Further, randomized experiments allow to control the content of the treatment received by subjects. Controlling the content of the treatments ensures that the information I provide to subjects is tailored for the particular aim of the study and retraceable in case researchers want to replicate this work in the future. Most importantly, as treatment assignment is random, subjects are not able

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<sup>3</sup> An important caveat is that in the experiments presented in this thesis I do not measure prior beliefs directly but only political predispositions and sociodemographic attributes.

to choose which treatment to receive. The randomization of treatment ensures that all subjects have the same probability to be exposed to the treatment, regardless of their individual or subgroup characteristics. Therefore, any differences in outcomes between the placebo and treatment groups can be attributed to sampling variability or the treatment itself.

Another practical advantage of survey experiments is that I can deliver multiple variations of a treatment and test delicate theoretical predictions. All experiments presented in this thesis leverage this advantage by administering treatments that carefully manipulate specific aspects of an intervention. For example, in Chapter 1, I deliver three treatments which consist of the same presidential address to the nation but at the end I provide partisan cues that there is elite consensus, elite dissensus, or that it is not yet clear whether partisan elites agree or disagree. In this sense, randomized experiments open the door to study the difference between two (or more) mutually-exclusive states of the world while holding observable and unobservable heterogeneity constant.

Finally, survey experiments allow for the administration of treatments to a large population composed of diverse individuals. Lab experiments take place in artificial environments that do not resemble the real world and use samples of participants that are small and not diverse enough to represent the target population. Survey experiments can partially overcome these obstacles because it is possible to recruit a large number of subjects who take the survey under conditions that are more natural than those of a laboratory at a university campus. Overall, survey experiments exhibit higher external validity and statistical power to detect small effects than lab experiments.

However, the survey experiments I present in this thesis are not completely unobtrusive with respect to four basic criteria (Gerber and Green 2012). The first criterion relates to the treatments. Despite the fact that most treatments are op-eds published in newspapers, some interventions use experimental materials that are somewhat unusual in the real world. For example,

in Chapter 2, I experimentally manipulate feelings of disgust with a video that subjects would probably avoid watching, if they had the choice to do so. The second criterion concerns the participants. In all four experimental studies, I use large nationally diverse, but not representative, samples of American citizens. Although recent research suggests that estimates from non-representative samples are similar to those obtained from probability samples (Coppock 2019; Coppock and McClellan 2019; Snowberg and Yariv 2021), the use of non-probability samples may have a negative impact on the generalizability of the results. Third, the treatments are not delivered in a natural context, e.g., in the newsfeed of a social network, but in the process of filling out a survey questionnaire. Finally, I collect outcome measures using self-report methods, which implies that observer and social desirability biases may creep in. Therefore, due to this imperfect realism and unobtrusiveness of the research design, the existence of demand effects cannot be ruled out.

### *Core assumptions of randomized experiments*

The unbiasedness of randomized experiments depends crucially on three assumptions (Gerber and Green 2012). The first assumption is random assignment, which dictates that all subjects have the same known probability between 0 and 1 of being assigned to receive the treatment. In principle, this assumption is justified by the very design of randomized experiments. However, it may be threatened by the presence of missing values in the outcomes. Indeed, to facilitate the analysis of the experiments, I further assume that missingness is random.

The second assumption is excludability or exclusion restriction. It states that subjects respond only to receipt of the treatment and not to their assignment to treatment or other

confounding factors of random assignment. The design of the experimental studies satisfies this assumption as I use the same procedures to measure outcomes in the treatment and placebo groups and I am not aware of any indirect by-products of random assignment or third-party interventions that could have jeopardized the exclusion restriction. The last assumption is non-interference, that subjects respond only to the treatment they individually receive and not to the treatments administered to other subjects. Given that the survey experiments were conducted online, it is unlikely that subjects knew what treatment other subjects received, and thus non-interference is unlikely to be violated.

### *Interpretation of experimental results*

A reader who is unfamiliar with experimental research may find the analysis and interpretation of experimental data somewhat confusing. To assist in a better understanding, it is useful to explain how experimental data are analyzed.

The estimands of interest are the Average Treatment Effect (ATE) and the Conditional Average Treatment Effect (CATE). The ATE is “the sum of the subject-level treatment effects [...] divided by the total number of subjects” (Gerber and Green 2012, 25). To estimate the ATE, I use two estimators. First, I use bivariate OLS regressions to obtain difference-in-means estimates. In the output of this estimator, the intercept is the average value of the outcome measure in the placebo group while the coefficient represents the average difference between treated and untreated subjects. Second, I adjust for pre-treatment covariates by estimating multivariate OLS regressions. These estimates are more accurate and are considered to be more reliable when the experimental design is not perfectly balanced. An important caveat is that the estimates  $\widehat{ATE}$  I

report are not necessarily equal to the population ATE. To calculate the population ATE, one would have to run an infinite number of replications of each experiment and then estimate a weighted average of all the observed  $\widehat{ATEs}$ , a task that is practically unfeasible.

To test heterogeneous treatment effects, I estimate the Conditional Average Treatment Effect (CATE), that is the ATE for different subgroups. I estimate the CATE by including a treatment-by-covariate interaction in the linear covariate-adjusted models. I then conduct nested F-tests to compare whether the covariate-adjusted models or the interactive models fit the data better. A statistically significant F-value implies that an interactive model performs better than its respective non-interactive covariate-adjusted model, and that there is a significant heterogeneous effect.

## OVERVIEW OF THE CHAPTERS

The thesis at hand is organized in four chapters. Each chapter stands independently and can be read in any order. The given order of the chapters is not based on their contribution to the main argument of the thesis but rather reflects the chronological order of the events on which I focus in the four case studies I present. Indeed, the order of the chapters follows the timeline of the major crises that the U.S. faced during the first nine months of 2020.<sup>4</sup> In the first chapter, I leverage the

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<sup>4</sup> This dissertation bears the marks of this odd year in an additional, more symbolic, way. The titles of the chapters are partially the product of binge-watching my way through quarantine, which is still in effect as these lines are written (March 2021). The titles of the first three chapters are a tribute to *Friends*, an old TV series that made home confinement a lot easier and more amusing. The key word in all three titles is “almost” as each intends to convey the current state of our fragile

assassination of Iranian major general Qasem Soleimani in January 2020 to study how citizens respond to partisan cues under terror threat. In the following chapter, I investigate how feelings of disgust move public opinion in the wake of the COVID-19 pandemic in March. In the third chapter, I examine the impact of ideological and non-ideological frames of global warming on citizens' attitudes toward environmental policies during the 2020 Atlantic hurricane season. The last chapter does not draw on a particular event but analyzes the effect of collective memories of past natural disasters and terrorist threats on preferences for policies to deal with current challenges.

Chapter 1 investigates the effect of partisan cues on attitudes toward counter-terrorism policies. I leverage the January 2020 crisis between the U.S. and Iran to test whether randomly exposing individuals to a fictional presidential statement about an imminent terrorist attack and partisan cues supporting or opposing this statement affects preferences for counter-terrorism policies. I demonstrate that citizens update their opinions in the expected direction and by approximately the same amount regardless of their political predispositions.

Chapter 2 deals with the impact of disgust and information on attitudes toward restrictive policies, prevention measures, and Asian minorities in the wake of the COVID-19 pandemic. Exposure to information affects preferences only for restrictive policies to fight the spread of the virus. In contrast, the standalone effect of incidental disgust, as well as its joint effect with information, are responsible for attitude change toward both pandemic-relevant and irrelevant policies, Asian minorities, and prevention measures. In addition, citizens respond symmetrically

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world: it is always on the verge of collapse but survives to die another day. The title of the last chapter is a reference to *Back to the Future*, a movie that depicts the hope that time travel will eventually solve many of our present problems but ignores the fact that it also represents a serious threat to causal inference based on randomization.



to information and disgusting stimuli across levels of political awareness, ideology, partisan affiliation, and trait authoritarianism.

Chapter 3 focuses on the effect of ideological and non-ideological framing on opinions about climate change and natural disasters. In a survey experiment conducted during the 2020 Atlantic hurricane season, I study whether randomly exposing individuals to ideological and non-ideological frames of climate change affects preferences for long-term environmental policies and disaster relief measures. The results suggest that for environmental messages to be persuasive they need to be framed in a manner that is, at a minimum, non-threatening to conservative values. However, when messages are persuasive, citizens update their opinions in parallel and independent of their degree of education, political awareness, or political predispositions.

Finally, Chapter 4 analyzes the effect of collective memories of past threats on public attitudes toward current challenges. I conduct a large survey experiment to test whether randomly stimulating memories of Hurricane Harvey and the 9/11 terrorist attacks affects preferences for environmental and counter-terrorism policies, respectively. Indeed, I find that citizens primed with collective memories increase their support for environmentalism and counter-terrorism in the same direction irrespective of their age or political attributes. However, the impact of collective memories is greater in the case of Hurricane Harvey than that of 9/11.

Together, the findings of these chapters offer systematic support that citizens change their minds in small increments, according to the evidence they receive, and independently of their background characteristics. The main body of the thesis presents the parts of the analysis that are more central to the argument I propose. Indeed, each chapter presents only the results for the direct effects of the treatments on the outcomes of interest and the respective tables. Due to their

extensive length, analyses about indirect, heterogeneous, and spillover effects can be found in the Appendices.

# CHAPTER 1

## The One Where WWII Almost Broke Out

### The Effect of Partisan Cues on Public Support for Counter-Terrorism Policies

**Summary:** In the face of terrorist threats governments implement policies to protect their citizens and national interest. Research suggests that public support for counter-terrorism policies depends on whether the U.S. President and partisan elites agree or disagree on the course of action that should be adopted. I leverage the January 2020 crisis between the U.S. and Iran to test whether randomly exposing individuals to a fictional presidential statement about an imminent terrorist attack and partisan cues supporting or opposing to this statement affects preferences for counter-terrorism policies. I demonstrate that citizens update their opinions in the expected direction and in a similar manner. Except for a ceiling effect among Republicans and authoritarians in certain cases, I find that public support for defensive and confrontational counter-terrorism policies increases regardless of political predispositions or the degree of political awareness. In an era of high affective polarization, the results show that the public still responds similarly when national security is threatened.

Although the American public has been characterized as “pretty prudent” for its moderate attitudes toward war (Jentleson 1992), it often responds aggressively when foreign actors challenge its feelings of security (Page and Shapiro 1992; Gadarian 2010) and especially so to terrorist threats (Huddy et al. 2005; Davis 2009; Nacos, Bloch-Elkon, and Shapiro 2011). In the wake of such dramatic events, information asymmetries increase in favor of political leaders. Indeed, their initiatives influence media coverage of the unfolding crisis and shape public perceptions about the policies needed to offset it (Brody 1991; Zaller 1992; Berinsky 2007; Baum and Groeling 2010).

Scholars suggest that the information environment (Iyengar and Kinder 1987; Delli Carpini and Keeter 1997; Prior 2009; Baum and Potter 2019) and the structure of information flows (Brody 1984; Zaller 1992; Katz 1957; Baum and Groeling 2009) shape public preferences when national security is breached. Yet, the bulk of the literature draws on observational data and provides contradictory results. Some researchers argue that bipartisan consensus draws the attention of the public to the severity of an international crisis and the policies that must be implemented (Larson and Savych 2005; Reifler, Gelpi, and Feaver 2006). Others posit that elite consensus is not a necessary condition to trigger rallies around the flag (Baker and Oneal 2001) or that the effect of perceived elite consensus is moderated by political predispositions (Baum and Groeling 2009; Gartner and Segura 2000) and institutional factors such as whether there is a unified or divided government in place (Brody 1991).

The implications of Americans’ susceptibility to elite persuasion are particularly important in times of elevated terror threat. During such periods the public is called to evaluate and conform to controversial policies with poor access to relevant information. Moreover, the implementation of counter-terrorism measures often sets a strong political precedent and creates a policy lock-in that is difficult to escape even when fears of terrorism fade away. This is particularly worrying as

many of these measures pose a direct threat to civil liberties and the openness of liberal democracies.

How susceptible are citizens' preferences to influence from political elites in the face of a terrorist attack? I argue that citizens update their attitudes toward counter-terrorism policies in a sensible manner as a function of their exposure to new information and the partisan cues they receive. More concretely, perceptions of partisan consensus or dissensus on the counter-terrorism strategy to be followed should impact public preferences for measures that aim to protect citizens but come with the price of restricting individual freedoms.

To study the effect of partisan cues on preferences for counter-terrorism policies, I leverage the international crisis that was triggered after the killing of Qasem Soleimani, the Iranian major general and right-hand man of Ayatollah Khamenei, in early January 2020. The fact that military tensions between the U.S. and Iran were high during this period lent credibility to the prospect of an imminent terrorist attack on U.S. soil. Importantly, because a divided government was in place with the Republican Party controlling the White House and the Senate and the Democratic Party having the majority in the House of Representatives, I was able to examine the effect of partisan cues in a conjecture where party positions mattered not only symbolically but also in terms of policy making.

In this context, I conducted a large-scale survey experiment with a nationally diverse sample of American citizens during the last week of January 2020. The experimental design allows for the investigation of the effect of partisan cues on preferences for counter-terrorism policies. Indeed, subjects were randomly assigned to read a fictional address by the U.S. President about an imminent terrorist attack orchestrated by Iran, followed by a statement that the Democratic leadership had avoided taking a position about the announcement or had taken a position in favor

of or against it. Randomizing exposure to different information flows not only bolsters the internal validity of the study, but also offers the opportunity to explore counterfactual scenarios that would not be readily available to observational studies.

I find that exposure to the fictional presidential address increases support for a broad spectrum of counter-terrorism policies. Attitude change occurs across all treatment conditions in the expected direction regardless of the Democratic response to the president's message. However, the findings suggest that there is an asymmetry in the manner certain subgroups of people update their opinions. More specifically, Democrats and individuals scoring low or medium in trait authoritarianism step out of party lines and support the president's initiatives even when the Democratic leadership opposes them. In contrast, Republicans and those who are more authoritarian do not update their preferences when informed that the Democratic Party agrees with the president. This finding suggests that their responses are subject to a ceiling effect because these subgroups support counter-terrorism policies at a higher rate even during peaceful periods. Finally, I find little evidence for heterogeneous effects with respect to political awareness and ideology in all three treatment conditions.

## **OPINION LEADERSHIP AND THE WAR ON TERROR**

Systematic evidence in the public opinion literature asserts that only a minority of citizens hold internally consistent attitudes toward politics in general (Converse 1964; Kinder 2006) and foreign policy in particular (Zaller 1992; cf. Page and Shapiro 1992). In normal times the American public knows little about foreign policy and engages even less with it (Holsti 2004; Baum and Potter 2019). Foreign policy often seems to be too abstract and complicated for typical Americans

to follow on a regular basis given that they cannot observe its consequences immediately in their daily lives. However, their attention is called upon issues relevant to foreign policy when they are exposed to information about casualties and threats to national security (Gartner 2008; Gartner and Segura 1998; Huddy et al. 2002; Norris, Kern, and Just 2003) and perceive intense disagreement among the elites (Mueller 1973; Brody and Shapiro 1989; Brody 1991; Zaller 1992).

The ideological innocence that characterizes Americans' attitudes toward foreign policy has two immediate consequences. First, the degree to which public opinion approves a presidential initiative in the international arena reflects the mix of elite rhetoric about said policy (Brody 1991; Berinsky 2007; Baum and Groeling 2010a). Americans look for information available in their environment and adjust their opinions depending on the elite signals they receive. Second, foreign policy preferences are thought to be exceptionally malleable in the early phases of a war or terrorist incident (Baum and Potter 2008). Due to an information asymmetry between elites and the public, the former, and most notably the president, can influence the perceptions of the public about a foreign policy crisis independent of the actual nature of the crisis.

Any causal chain of attitude change in times of heightened terrorist threat begins with the president. The power of the president to lead public opinion and persuade often goes unquestioned. To draw attention to an imminent national security threat, the president often chooses to address the nation (Brody 1984; Brody and Shapiro 1989). Although the American public has been found to oppose offensive wars (Jentleson 1992; Jentleson and Britton 1998), presidents routinely take advantage of its relative ignorance about foreign policy to frame their military initiatives as defensive or justified in terms of national interest and honor (Norris, Kern, and Just 2003; Kuypers 2006).

After a terrorist attack, an information cascade is activated (Entman 2003a; 2003b) as the president leverages his privileged access to information to influence other members of the political elite (e.g. members of the Congress, foreign leaders). They, in turn, take positions that affect media content and frames consumed by public opinion. Althaus and Coe (2011) provide evidence that the ebb and flow of war news predicts public support for the continuation of hostilities. Importantly, it is not the actual content of the news that drives public opinion but rather its exposure to nationalistic cues. If the news coverage does not include nationalistic appeals, it is not effective in changing war attitudes regardless of how positive its content may be. Indeed, priming attachment to superordinate identities increases cross-party agreement on salient issues as individuals tend to prioritize their American national identity over their party or racial identification (Transue 2007; Levendusky 2017). In this regard, presidential addresses to nation have been found to exert strong influence on public opinion (Baum 2002).

But can the president actually influence public opinion in general and in particular regarding counter-terrorism? Despite the fact that folk theory and even political pundits answer this question with an unequivocal “yes,” literature offers contradictory evidence. A strand of research suggests that elites, and notably the president, have leeway in changing citizens’ attitudes. Lenz (2012) demonstrates that citizens do not lead politicians on policy issues regardless of how salient an issue is, how their own preferences evolve through time or whether they learn the party or candidate positions on issues. Instead, ordinary people choose which candidate to follow using cues such as their party identity or appearance and then adopt their positions on various policy issues. These results resonate with recent experimental evidence showing that voters change their views to match those of their leaders even when they offer no justification about their stances on



policy issues (Broockman and Butler 2017). Most worryingly, citizens defer blindly to elites and fail to hold their representatives accountable for taking positions different than their own.

On the other hand, certain scholarly works are more skeptical about the power of elites to move public opinion. Although presidents are increasingly engaged in a permanent campaign to communicate their policies and persuade citizens, their efficiency is often limited (Edwards III 2003). Individuals seem to respond poorly to elite messages irrespective of whether their content is related to domestic or foreign affairs or how charismatic the president is. Instead, presidents can only affect Americans' views at the margin. That is, presidents cannot direct drastic changes in attitudes but rather serve as facilitators who reflect the policy mood of the public and search for opportunities to lead their constituents in the direction they already want to go (Edwards III 1989).

Yet another body of literature offers mixed results. These findings suggest that elites and in particular the president can influence public opinion if and only if certain conditions are met. Page and Shapiro (1992) observe that armed conflict and war constitute catalysts of attitude change toward a broad spectrum of issues ranging from military preparedness, defense spending, and economic sacrifices to foreign aid, international involvement, and alliances. However, not all presidents are able to stimulate this change. Indeed, it is mostly popular presidents who stand at a bully pulpit while their less popular counterparts struggle to sway people's opinions in their favor. In a similar line of thinking, Canes-Wrone and Marchi (2002) show that a president can capitalize on his popularity to pass a bill into law only when the public perceives the relevant issue to be salient and sufficiently complex. Both arguments seem to support Wildavsky's (1998) two presidencies thesis. Wildavsky argues that U.S. presidents are much more efficient in persuading other members of the elite and the public regarding foreign affairs than domestic policies, exactly because these issues often become salient suddenly after a major crisis and are difficult to address

without access to relevant information. In view of this evidence, I hypothesize that exposure to the fictional presidential address will increase support for counter-terrorism measures ( $H_1$ ).

## **PARTISAN CUES AND ELITE PERSUASION**

Partisan elites have two options when a president addresses the nation: they can either support or oppose his initiatives to fight a terrorist threat. Because typical Americans possess little knowledge on foreign policy, elite cues play an important role in the beginning of international crises but can also predict the levels of public support throughout the course of wars. Although rarely studied up until recently in the foreign policy literature (but see Zaller 1992; Page and Shapiro 1992; Baum 2002; Shapiro and Bloch-Elkon 2007; Berinsky 2007; Baum and Groeling 2009), partisan cues are useful and widely employed in various aspects of preference formation and change (for a review, see Druckman and Lupia 2016).

Constantly browsing the environment for political information is a time-consuming and expensive enterprise with only poor returns in terms of choosing the best available option (Downs 1957; Lopez de Leon and Rizzi 2014). To reduce the costs of information citizens use *heuristic cues*, cognitive shortcuts that allow them to make quick and efficient judgments (Tversky and Kahneman 1974; Popkin 1994; Kuklinski and Quirk 2000).

Conventional wisdom states that heuristics, including partisan cues, are used mostly by cognitive misers who know little and care less about politics. In contrast, Lau and Redlawsk (2006) find that cues are commonly used as a shortcut irrespective of the degree of political knowledge that people display. Interestingly, people knowledgeable about politics use different cues than less sophisticated individuals and use them more efficiently. Indeed, knowledgeable citizens rely

heavily on ideology and group endorsements to make political judgments, whereas their less informed counterparts pay more attention to partisan cues and candidate appearance. This reliance becomes more pronounced in complex contexts where the political stakes are less obvious.

There is conflicting evidence about the efficiency of partisan cues to persuade citizens and help them make correct choices. Lupia (1994) demonstrates that cues offer sufficient clues to individuals to help them arrive to decisions they would have made had they been exposed to detailed information. Indeed, citizens often change their preferences based on partisan cues rather than detailed information on policy issues, and they do so oblivious to the fact that cues affect their decisions (Cohen 2003). Polarized environments can strengthen this tendency resulting in a less informed and deliberate citizenry (Druckman, Peterson, and Slothuus 2013). Elite polarization on policy issues increases the propensity of individuals to stick to the party line and defend it with greater confidence regardless of the content of the policy.

However, there are scholarly works suggesting that partisan cues may not be that influential. Bullock (2011) finds that, when presented with detailed descriptions of policy issues and partisan cues, citizens base their decisions equally on both sources of information. Moreover, the effect of partisan cues can be moderated by citizens' previously acquired dispositions and identification (Slothuus 2010). Another source of resistance to partisan cues is issue salience (Carsey and Layman 2006). When citizens find an issue to be salient and parties take different positions on it, they change their party identification with respect to the said issue. Conversely, when an issue is not salient, citizens adopt the position of their party. Hence, there is a limit to what elites can achieve when attempting to change people's minds.

During security crises, observing partisan, and particularly congressional, consensus (or dissensus) leads to higher approval (or disapproval) of presidential foreign policy initiatives

(Brody and Shapiro 1989; Zaller 1992; Larson 1996b; Baum and Groeling 2009). When citizens observe elite disagreement about how to respond to a terrorist threat, they tend to sort themselves along partisan lines. In contrast, when citizens observe elites expressing bipartisan consensus for the course of action put forward by the president, dissenting voices are shut down as “unpatriotic” or “naïve” resulting in a spiral of silence (Noelle-Neumann 1993).

For elite consensus to be effective, a divided government needs to be in place and members of the opposition party should praise the president for his handling of the crisis (Brody 1991). Similarly, members of the president’s party should refrain from expressing vocal criticism against his actions (Baum and Groeling 2009). In the face of bipartisan support citizens reward the president with higher approval ratings and become more supportive of his policies (Larson 1996; Larson & Savych, 2005; Berinsky, 2007; Reifler et al., 2006). Indeed, elite consensus drives the rally ‘round the flag effect that manifests itself into these upward, yet often short-lived, spikes in presidential job approval ratings (Mueller 1973; Brody 1991; Baum 2002; cf. Baker & Oneal, 2001). Given these findings, I expect that support for counter-terrorism will be higher when individuals observe partisan consensus than dissensus ( $H_2$ ).

## **INFORMATION AND ATTITUDE CHANGE**

To study how people change their attitudes toward counter-terrorism policies, I draw on three theories of public opinion and test their conflicting hypotheses. More specifically, I focus on the Bayesian Learning Model, Zaller’s Receive-Accept-Sample (RAS) model, and motivated reasoning. Despite their partial overlapping, these three theoretical accounts offer distinctive expectations about the persuasiveness of presidential messages and the efficiency of partisan cues

in times of high terror threat. Importantly, they give different answers to the question of which subgroups of the public will change their mind and in which direction. To better organize the competing expectations, I create one set of hypotheses stemming from the Bayesian Learning Model and a second set that derives from the RAS model and motivated reasoning.

The Bayesian Learning Model posits that individuals change their attitudes by using their priors to evaluate new information and respond to it (Gerber and Green 1999; Bullock 2011). Although Bayesian learning at the individual level is compatible with various and often diverging predictions of opinion change, it is consistent with the conceptualization of the American public as a rational collectivity that possesses more or less stable positions and informs them in a sensible manner according to new information (Page and Shapiro 1992). Indeed, Page and Shapiro analyzed the preferences of the American public on 169 policy issues across fifty years and concluded that Americans update their opinions in parallel independent of their gender, race, education, occupation, income, religion, age, partisanship, region, and community. If the parallel publics thesis mirrors attitude change at the individual level, then the expectation should be that citizens update their attitudes in the direction of evidence ( $H_{3a}$ ) and irrespective of their background characteristics ( $H_{3b}$ ).

On the other hand, Zaller's RAS model (1992) explains that citizens update their opinions contingent on their degree of political awareness, predispositions, and the nature of the messages they receive. When elite rhetoric is one-sided, a "mainstream pattern" emerges and citizens adopt the position of their leaders. However, people may reject elite messages that challenge their preexisting and firmly held beliefs. In contrast, when people are caught in two-sided flows of incongruent information and observe partisan bickering over an issue, they sort themselves largely along partisan lines. But to receive a political message an individual should be at least somewhat

attentive to politics in the first place. People that know little about politics and are not interested in it are less likely to encounter political messages. Hence, these citizens cannot form meaningful attitudes toward political issues. Importantly, the probability of attitude change does not increase monotonically as political awareness rises. Citizens who are too invested in politics resist changes more than their less engaged counterparts. Indeed, knowledgeable citizens display relatively coherent attitudes that exhibit higher inertia to change (Converse 1964).

For the most part, theories of motivated reasoning are compatible with the RAS model. The common ground of theories of motivated reasoning is that people update their opinions in a biased manner in order to reaffirm their preexisting beliefs and reduce uncertainty. The first study of motivated reasoning was from Hastorf and Cantril (1954) who demonstrated that group identities affect perceptions and evaluations of reality. Since then, different “flavors” of motivated reasoning have been explored in the literature. Some theories underscore people’s epistemic need to rationalize their positions on issues by evaluating supporting arguments as more compelling than opposing arguments. Spending more time and effort to counterargue incongruent messages may result not only in resisting a message but also in a backlash effect (Taber and Lodge 2006; Lodge and Taber 2013; Groenendyk and Krupnikov 2020). Other approaches stress the importance that individuals assign to defending their cultural identity against different worldviews (Kahan, Jenkins-Smith, and Braman 2011) and justifying the status quo to satisfy their existential and relational needs (Jost 2004).

Overall, three expectations about the persuasiveness of partisan cues stem from the RAS model and theories of motivated reasoning. First, because the White House is controlled by the Republican Party the presidential message should affect the attitudes of Republicans, conservatives, and authoritarians more than those of Democrats, liberals, and less authoritarian

individuals ( $H_{4a}$ ). Second, when informed that the Democratic leadership supports (opposes to) the counter-terrorism strategy of the president, Democrats, liberals, and less authoritarian people should increase (decrease) their support for counter-terrorism measures while the opinions of Republicans, conservatives, and more authoritarians should remain unchanged or change in the opposite direction ( $H_{4b}$ ). Finally, these effects should be more pronounced contingent on the degree of political awareness that individuals display ( $H_{4c}$ ).

## **SUMMARY OF THE ARGUMENT**

I argue that when facing a terrorist threat, citizens update their attitudes toward counter-terrorism in an understandable way as a function of their exposure to new information and the partisan cues they receive. More specifically, individuals should increase their preferences for counter-terrorism policies when exposed to the fictional presidential address to the nation about an imminent terrorist attack. Further, observing partisan consensus should reinforce attitudes toward taking measures against the terrorist threat, whereas partisan disagreement should lead to lower support. Finally, attitude change should occur in parallel across different subgroups of the population.

## **RESEARCH DESIGN AND METHODS**

To empirically test my argument, I conducted a large survey experiment three weeks after the Iranian major general Qasem Soleimani was killed by U.S. drone strike near Baghdad International Airport in Iraq on January 3, 2020. Soleimani's assassination spurred widespread

fear for Iranian retaliation and the prospect of hostilities escalating to war. Because of his prominent position in Iranian politics, Iran committed publicly to avenge him by targeting Americans at home and abroad. This context increases the external validity of my experimental design as a terrorist attack was a credible threat at the time.

The study was administered with a nationally diverse sample of American citizens ( $N = 2,349$ ) by Lucid from January 22 to 31, 2020.<sup>1</sup> It features four experimental arms, a placebo and three treatment groups. To increase statistical precision, a total of 975 subjects were randomly assigned to the placebo group while treatment groups 1, 2, and 3 include 463, 453, and 458 subjects, respectively.

### ***Procedure***

Subjects were randomly assigned to one of four groups after filling out a short questionnaire to collect baseline information. All treatments used experimental deception and

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<sup>1</sup> Lucid is the largest marketplace for online samples in the United States. Lucid uses quota sampling and a matching algorithm to produce an Internet sample that closely approximates the marginal (but not necessarily joint) distributions of demographic characteristics for the general population of the U.S. as found in the most current national census. Coppock and McClellan (2019) find that samples on Lucid resemble representative probability samples closer than those obtained from MTurk in almost every observable demographic, political, and psychological attribute. The experimental study lasted for approximately 15 minutes and had a completion rate of 73.78%. This research was reviewed and approved by the Institutional Review Board of Columbia University (IRB-AAAS8254).



consisted of reading a 330-word fictional, impending address to the nation by the U.S. President about an imminent attack led by Iranian terrorists.<sup>2</sup> The presidential statement was followed by a short note informing about the stance of the Democratic Party. To collect outcomes subjects completed a survey after receiving the treatment.

In the placebo group, subjects read an article about the history and cultural importance of oak trees. In treatment group 1, subjects were informed that a presidential statement had been leaked by a trusted anonymous source and were invited to read it. The presidential address to the nation employed a nationalist rhetoric to inform citizens that Iran was plotting an imminent terrorist attack on U.S. soil and that counter-terrorism measures needed to be taken. At the end of the statement subjects were informed that the Democratic leadership would reserve its response until the president officially addressed the nation. Informing subjects that the Democratic Party avoided to take a position aimed to serve as a neutral cue that offered ambiguous information about what the party was planning to do. However, in a period of heightened party conflict it is reasonable to assume that most subjects anticipated that Democrats would be critical of the president.

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<sup>2</sup> Although deceiving participants about the intent of a study is a common practice in psychological research, economists are more skeptical about the ethical and substantial implications of deception. However, recent research provides evidence that neither concern is empirically justified. Indeed, deception does not “pollute” subject pools as subjects’ suspicion about the credibility of the studies they participate in is not associated with past experiences of experimental deception (Krasnow, Howard, and Eisenbruch 2019). Similarly, the abstraction from reality that deception necessarily involves does not affect subjects’ post-treatment answers (Brutger et al. 2020).

In treatment group 2, subjects read the same presidential statement but were also informed that the Democratic leadership was in favor of the President's initiative. Finally, in treatment group 3 subjects were exposed to the same statement as in the two other treatment groups but read that the Democratic leadership opposed the presidential plan of action. This design allows to study how a presidential statement and partisan cues affect public support for counter-terrorism policies. The full wording of the treatments is available in Appendix D.

### *Analytic Strategy*

The estimands of interest are the Average Treatment Effect (ATE) and the Conditional Average Treatment Effect (CATE). In randomized experiments, the ATE is a measure used to compare interventions and is equal to the difference in average outcomes between subjects assigned to the placebo condition and subjects assigned to each of the treatment groups, separately to avoid problems with multiple comparisons. I obtain difference-in-means estimates with a bivariate linear regression while I adjust for pre-treatment covariates by calculating multivariate regressions. Indeed, the latter estimates should be considered more reliable because the balance test suggests that the design is not perfectly balanced (see Tables A1 and A2 in Appendix). When needed, heteroscedasticity-consistent (HC1) standard errors are estimated.

To explore heterogeneous treatment effects, I estimate the Conditional Average Treatment Effect, that is the ATE for different subgroups. I estimate the CATE by including a treatment-by-covariate interaction in the linear covariate-adjusted models to capture the conditional effect of political awareness, ideology, partisan identity, and trait authoritarianism, separately. The effects of these interactions do not have a causal interpretation but rather indicate whether the ATE varies

across the levels of the pre-treatment variable. Finally, I conduct a total of 144 F-tests and compare the covariate-adjusted models to the conditional models.

## ***Measures***

Before being randomly assigned to treatment, subjects completed a short survey with questions about their demographic characteristics, political interest, ideology, partisan identity, and trait authoritarianism. To measure political awareness I construct a composite scale of education and political interest (Zaller 1992). Accordingly, I measure trait authoritarianism by adding four items measuring child-rearing values (Pérez and Hetherington 2014). The post-treatment survey measured preferences for counter-terrorism policies and policies irrelevant to terrorism as well as national attachment and authoritarian attitudes. Outcomes were measured with 5 or 7-point scales and all variables were normalized to range from 0 to 1.

I tapped into support for counter-terrorism policies with eight measures. Subjects were asked how much they favored or opposed a drone strike in Iran, torture as a means to gain information from suspected terrorists, expanding the war on terrorism to Iran and any other country suspected of harboring or supporting terrorists, deploying ground troops in metropolitan areas in the U.S., deporting immigrants or Muslims, shutting down the borders, and censoring social media for security reasons. Moreover, subjects were asked whether or not they thought it was necessary for the average person to give up some civil liberties in order to curb terrorism.

Results from principal axis factoring with *promax* rotation suggest that two factors underlie preferences for counter-terrorism policies (see Table A3 in Appendix). Accordingly, I create a composite scale for the factor that determines preferences for defensive measures by summing up attitudes toward shutting down the borders and deporting immigrants or Muslims (*Cronbach's*

$\alpha = 0.825$ ), and another one that comprises the remaining attitudes toward confrontational counter-terrorism policies (*Cronbach's alpha* = 0.796). I also construct a scale that measures the public's general demand for counter-terrorism policies and sums up preferences for both defensive and confrontational policies (*Cronbach's alpha* = 0.872).

Further, I measured attitudes toward a number of policies that are irrelevant to terrorism, that is preferences for same-sex marriage, abortion rights, gun control, death penalty, increasing taxes for the rich, and implementing a universal healthcare program. At the end of the survey, subjects were asked a series of questions tapping into different types of national attachment and right-wing authoritarian preferences. Items measuring national attachment were adapted from Kosterman and Feshbach (1989) and Huddy and Khatib (2007). In particular, I created four 2-item scales that measure patriotism (*Cronbach's alpha* = 0.882), nationalism (*Cronbach's alpha* = 0.648), internationalism (*Cronbach's alpha* = 0.631), and symbolic patriotism (*Cronbach's alpha* = 0.931). Accordingly, I measured right-wing authoritarianism using a 6-item scale (*Cronbach's alpha* = 0.676) introduced and validated by Bizumic and Duckitt (2018).

## EMPIRICAL RESULTS

I present the results by analyzing each counterfactual scenario separately. I begin by reporting the direct effects of exposure to the presidential statement without the presence of partisan cues (*one-sided flow of information*) on support for counter-terrorism policies. I then focus on how partisan consensus or dissensus (*two-sided flows of congruent/incongruent information*) affects preferences for measures to fight terrorism. Overall, the estimates of the ATE suggest that

treatments affect attitudes positively and attitude change is substantively medium to small ranging from 3.4 to 10.7 percentage points.

Subsequently, I explore the effects of treatments conditional on political awareness, ideology, partisan affiliation, and trait authoritarianism. I find little evidence for heterogeneous effects except for when partisan consensus is observed. In this case, a ceiling effect occurs with republicans and more authoritarians often resisting the messages and not updating their already strong preferences for counterterrorism. I also find no support for the existence of downstream effects on preferences for policies that are not related to terrorism. Finally, I argue that treatment effects are not mediated by an increase in national attachment or authoritarian preferences and attitude change is the direct consequence of exposure to experimental treatments.

To organize the results, I divide all tables in three parts. The first row in each part reports the estimate of the average treatment effect of each treatment on the outcome of interest and the second reports estimated standard errors from OLS regressions, adjusted for heteroskedasticity when needed. The third row presents two-tailed  $p$ -values. The fourth and fifth rows present the intercept and the respective standard errors. In the next row, I note whether the model includes controls for pretreatment covariates. The last row indicates the size of the sample.

### ***Presidential Address: One-sided flow of information***

This section reports tests for the effect of the presidential address on preferences for counter-terrorism policies. I focus on the results presented in the first part of Tables 1-3. Outcomes in Table 1 include the extent of public support for shutting down the borders, deporting immigrants, deporting Muslims, and supporting a drone strike in Iran. Exposure to the presidential

address increases preferences for all measures except for the deportation of immigrants ( $p = 0.243$ ). Indeed, the presidential address increases public demands to shut down the borders by 5.2 percentage points ( $p = 0.007$ ), deport Muslims by 6.6 p.p. ( $p < 0.001$ ), and carry out a drone strike in Iran by 4.6 p.p. ( $p = 0.017$ ).

Table 2 reports the results from four additional tests about public preferences for counter-terrorism. It presents results for expanding the war on terrorism to Iran and other countries suspected of harboring terrorists, deploying troops in U.S. cities, torturing suspected terrorists to gain information, and censoring social media for security reasons. Reading the presidential statement increases support for expanding the war on terror by 4.9 p.p. ( $p = 0.010$ ) and deploying troops in U.S. cities by 9.2 p.p. ( $p < 0.001$ ). However, public support for torture as a means to extract information from suspected terrorists and censoring social media does not increase significantly ( $p > 0.083$ ).

Table 3 presents the effects of the presidential address to the nation on trade-offs between civil liberties and security as well as on three composite scales that sum up preferences for counter-terrorism policies. Overall, citizens increase their demand for counter-terrorism measures by 3.7 p.p. ( $p = 0.006$ ). In particular, public support increases for both defensive ( $\widehat{ATE} = 0.042$ ,  $p = 0.006$ ) and confrontational policies ( $\widehat{ATE} = 0.040$ ,  $p = 0.006$ ) alike. In contrast, the treatment does not affect the willingness of subjects to give up their civil liberties in order to fight terrorism ( $p = 0.378$ ).

Table 1.1 The direct effects of treatments on preferences for counter-terrorism policies

	Counter-terrorism Policies (1)							
	Shut down the borders		Deport immigrants		Deport Muslims		Launch a drone strike in Iran	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Presidential Address</i>								
ATE	0.046	0.052	0.017	0.022	0.064	0.066	0.054	0.046
(SE)	(0.022)	(0.019)	(0.020)	(0.019)	(0.018)	(0.018)	(0.022)	(0.019)
<i>p-value</i>	0.036	0.007	0.396	0.243	<0.001	<0.001	0.013	0.017
Intercept	0.447	0.053	0.332	0.068	0.234	0.044	0.455	0.034
(SE)	(0.012)	(0.041)	(0.011)	(0.040)	(0.010)	(0.038)	(0.012)	(0.041)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1351	1146	1359	1147	1342	1139	1271	1084
<i>Treatment Group 2 : Cues of Democratic Support</i>								
ATE	0.045	0.067	-0.024	-0.010	0.047	0.052	0.039	0.057
(SE)	(0.023)	(0.020)	(0.020)	(0.019)	(0.019)	(0.018)	(0.022)	(0.020)
<i>p-value</i>	0.050	0.001	0.226	0.592	0.014	0.005	0.083	0.005
Intercept	0.447	0.017	0.332	0.044	0.234	0.027	0.455	0.057
(SE)	(0.012)	(0.046)	(0.011)	(0.042)	(0.010)	(0.040)	(0.012)	(0.044)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1323	1127	1338	1126	1324	1121	1234	1051
<i>Treatment Group 3 : Cues of Democratic Opposition</i>								
ATE	0.026	0.028	0.026	0.016	0.064	0.058	0.063	0.063
(SE)	(0.022)	(0.020)	(0.020)	(0.019)	(0.019)	(0.018)	(0.022)	(0.019)
<i>p-value</i>	0.248	0.151	0.206	0.389	<0.001	0.001	0.004	0.001
Intercept	0.447	0.033	0.332	0.026	0.234	0.047	0.455	0.101
(SE)	(0.012)	(0.043)	(0.011)	(0.041)	(0.010)	(0.038)	(0.012)	(0.042)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1342	1144	1358	1152	1336	1143	1266	1084

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 1.2 The direct effects of treatments on preferences for counter-terrorism policies  
(continued)

	Counter-terrorism Policies (2)							
	Expand war on terrorism to Iran & other countries		Deploy troops in U.S. cities		Torture suspected terrorists		Censor social media	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Presidential Address</i>								
ATE	0.049	0.049	0.078	0.092	0.036	0.035	0.017	0.022
(SE)	(0.021)	(0.019)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)
<i>p-value</i>	<i>0.019</i>	<i>0.010</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>0.085</i>	<i>0.083</i>	<i>0.409</i>	<i>0.280</i>
<u>Intercept</u>	0.526	0.158	0.322	0.138	0.361	0.162	0.454	0.217
(SE)	(0.012)	(0.041)	(0.011)	(0.043)	(0.011)	(0.042)	(0.011)	(0.044)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1296	1107	1282	1092	1341	1135	1328	1121
<i>Treatment Group 2 : Cues of Democratic Support</i>								
ATE	0.014	0.032	0.100	0.105	-0.002	0.027	-0.018	-0.018
(SE)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.021)	(0.021)
<i>p-value</i>	<i>0.501</i>	<i>0.116</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>0.909</i>	<i>0.187</i>	<i>0.375</i>	<i>0.390</i>
<u>Intercept</u>	0.526	0.160	0.322	0.103	0.361	0.150	0.454	0.177
SE	(0.012)	(0.044)	(0.011)	(0.044)	(0.011)	(0.044)	(0.011)	(0.047)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1258	1075	1256	1069	1308	1105	1303	1100
<i>Treatment Group 3 : Cues of Democratic Opposition</i>								
ATE	0.060	0.051	0.107	0.095	0.033	0.057	-0.0002	-0.006
(SE)	(0.021)	(0.019)	(0.020)	(0.020)	(0.021)	(0.020)	(0.021)	(0.021)
<i>p-value</i>	<i>0.004</i>	<i>0.009</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>0.124</i>	<i>0.005</i>	<i>0.989</i>	<i>0.761</i>
<u>Intercept</u>	0.526	0.171	0.322	0.106	0.361	0.192	0.454	0.174
(SE)	(0.012)	(0.042)	(0.011)	(0.043)	(0.011)	(0.044)	(0.011)	(0.045)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1295	1113	1280	1094	1340	1139	1330	1126

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.



Table 1.3 The direct effects of treatments on preferences for counter-terrorism policies (continued)

	Counter-terrorism Policies (3)							
	Civil Liberties vs. Security		Counter-terror. policies (scale)		Defensive counter-terror. policies (scale)		Confrontational counter-terror. policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Presidential Address</i>								
ATE	-0.024	-0.024	0.034	0.037	0.037	0.042	0.037	0.040
(SE)	(0.025)	(0.027)	(0.016)	(0.013)	(0.018)	(0.015)	(0.016)	(0.014)
<i>p-value</i>	0.339	0.378	0.034	0.006	0.037	0.006	0.022	0.006
Intercept	0.213	0.121	0.396	0.122	0.335	0.057	0.429	0.154
(SE)	(0.014)	(0.055)	(0.009)	(0.029)	(0.010)	(0.032)	(0.009)	(0.031)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1112	956	1097	953	1288	1100	1132	981
<i>Treatment Group 2 : Cues of Democratic Support</i>								
ATE	-0.020	-0.012	0.020	0.034	0.022	0.035	0.017	0.031
(SE)	(0.026)	(0.028)	(0.017)	(0.014)	(0.018)	(0.016)	(0.017)	(0.015)
<i>p-value</i>	0.438	0.673	0.246	0.018	0.218	0.030	0.313	0.038
Intercept	0.213	0.105	0.396	0.079	0.335	0.014	0.429	0.133
SE	(0.014)	(0.062)	(0.009)	(0.031)	(0.010)	(0.034)	(0.009)	(0.033)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1079	934	1048	918	1255	1075	1088	947
<i>Treatment Group 3 : Cues of Democratic Opposition</i>								
ATE	-0.029	-0.029	0.047	0.044	0.022	0.037	0.048	0.044
(SE)	(0.025)	(0.027)	(0.016)	(0.013)	(0.018)	(0.015)	(0.016)	(0.014)
<i>p-value</i>	0.237	0.289	0.003	0.001	0.218	0.016	0.003	0.002
Intercept	0.213	0.094	0.396	0.105	0.335	0.035	0.429	0.153
(SE)	(0.014)	(0.057)	(0.009)	(0.029)	(0.010)	(0.033)	(0.009)	(0.031)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1112	972	1105	967	1255	1103	1140	994

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

The results suggest that exposure to a presidential statement about the need to adopt counter-terrorism policies in the face of a terrorist attack prompts citizens to demand stronger protection against such threats. Hence, taken together, these findings offer support for Hypothesis 1, but evidence invites optimism with respect to the resilience of public support for civil liberties. Indeed, Americans are reluctant to sacrifice some of their liberties on the altar of national security and disapprove policies that threaten either their rights to freedom of expression or the rights of suspected terrorists to be treated with fairness and dignity. An alternative explanation could be that these attitudes are founded on deep-seated beliefs and more intense interventions are needed in order to affect them.

***Partisan Consensus: Two-sided flows of congruent information***

I now turn my focus to the direct effects of perceived partisan consensus on preferences for counter-terrorism policies. Results are shown in the second part of Tables 1-3. A first look at the findings reveals that receiving a cue that the Democratic leadership supports the course of action announced by the president increases preferences for taking measures against terrorism substantively (albeit not significantly) more than being exposed merely to the presidential address.

More specifically, perceived partisan agreement on taking security measures increases support for shutting down the borders by 6.7 p.p. ( $p = 0.001$ ), deporting Muslims by 5.2 p.p. ( $p = 0.005$ ), launching a drone strike in Iran by 5.7 p.p. ( $p = 0.005$ ), and deploying troops in U.S. cities by 10.5 p.p. ( $p < 0.001$ ). However, it did not affect other attitudes significantly (all  $ps > 0.116$ ). Once again, citizens increase their demand for counter-terrorism policies ( $\widehat{ATE} = 0.034$ ,  $p = 0.018$ ), both defensive ( $\widehat{ATE} = 0.035$ ,  $p = 0.030$ ) and confrontational ( $\widehat{ATE} = 0.031$ ,  $p = 0.038$ ).

### ***Partisan Dissensus: Two-sided flows of incongruent information***

This section reports evidence about how receiving a cue that the Democratic leadership opposes to the presidential statement affects attitudes toward counter-terrorism. Results are presented in the third part of Tables 1-3. With few exceptions partisan dissensus over counter-terrorism does not hinder public support for security measures.

Citizens consistently update their opinions in favor of policies that can help curb terrorism. Indeed, subjects in the treatment group become more supportive of deporting Muslims by 5.8 p.p. ( $p = 0.001$ ), carrying out a drone strike in Iran by 6.3 p.p. ( $p = 0.001$ ), expanding the war on terrorism to Iran and other countries suspected of helping terrorists by 5.1 p.p. ( $p = 0.009$ ), deploying troops in U.S. cities by 9.5 p.p. ( $p < 0.001$ ), and torture as a means to interrogate suspected terrorists by 5.7 p.p. ( $p = 0.005$ ). Other attitudes remain unaffected (all  $ps > 0.151$ ). Support for counter-terrorism measures rises in general ( $\widehat{ATE} = 0.044$ ,  $p = 0.001$ ) and in particular for defensive ( $\widehat{ATE} = 0.037$ ,  $p = 0.016$ ) and confrontational policies ( $\widehat{ATE} = 0.044$ ,  $p = 0.002$ ).

Overall, the evidence from the two last sections speaks only partially in favor of Hypothesis 2. Although in certain cases partisan consensus increases preferences for counter-terrorism policies substantively, but not significantly, more than partisan dissensus, the public is willing to put aside partisan differences and support measures that bolster national security even when it perceives partisan bickering.

### ***Heterogeneous Effects***

Yet, how do different subgroups update their opinions when exposed to the treatments? In this section, I focus on attributes that are thought to be strong moderators of attitude change:

political awareness, ideology, partisan identity, and trait authoritarianism. To explore heterogeneous effects, I estimate 144 conditional models, that is four models for each outcome in each treatment arm. The results from the respective F-tests are presented in Tables B1-B3 in Appendix B. A statistically significant F-value indicates that an interactive model fits the data better than the nested non-interactive covariate-adjusted model.

Partisan identity is arguably one of the important vectors of political attitudes in contemporary American politics. As social, racial, and ideological identities become more aligned to Democratic and Republican identities, partisans tend to sort themselves into more homogeneous tribes resulting in higher affective polarization (Green, Palmquist, and Schickler 2004; Mason Lilliana and Wronski Julie 2018; Iyengar et al. 2019). An ongoing and often heated debate concerns whether Republicans and Democrats are equally susceptible to identity-based politics (Grossmann and Hopkins 2016; Morisi, Jost, and Singh 2019; Baron and Jost 2019; Ditto et al. 2018).

Although theories of motivated reasoning and the RAS model predict that citizens' partisan identity would condition the effects of the presidential address and partisan cues, I find little evidence to support this claim. Indeed, when exposed only to the presidential statement or cues about partisan dissensus, only 3 out of 24 F-values achieve statistical significance at the 0.05 level. In contrast, in the case of perceived partisan consensus over counter-terrorism measures, a total of 7 out of 12 F-tests provide a statistically significant value. The results from the conditional models suggest that reading that the Democratic leadership intends to support the strategy of the president against terrorism prompts Democrats to update their opinions in a positive direction, but Republicans resist the message.

A similar trend can be observed when it comes to the moderating effect of trait authoritarianism, which is conceived as the predisposition to maintain some kind of collective oneness and sameness through strong leadership (Stenner 2005; Stenner and Haidt 2018). Authoritarianism has been found to predict public support for a plethora of counter-terrorism policies (Crowson, DeBaker, and Thoma 2005; Feldman and Stenner 1997). Across 24 F-tests, when individuals are exposed to the presidential address or inter-partisan disagreement, only 4 values are below the conventional level of statistical significance. However, in the case of two-sided congruent information 5 out of 12 comparisons are statistically significant. The treatment only affects the opinions of people who score medium or low in authoritarianism while more authoritarians fail to update their views. This is in line with findings from Suhay and Hetherington (2011) who report a ceiling effect in how perceived threat affects the preferences for counter-terrorism among authoritarians who already support such policies in normal times.

Finally, ideology and political awareness seem to perform poorly as moderators. Regarding ideology, only 3 out of 36 conditional models fit the data better than their non-interactive counterparts. On the other hand, there is no evidence that individuals change their attitudes according to their degree of political awareness. Against the expectations of the RAS model, citizens change their preferences similarly regardless of how invested they are in politics.

Overall, the evidence offers overwhelming support for the parallel public thesis (Hypotheses 3a and 3b) as individuals seem to change their preferences in the same direction and at similar rates (Page and Shapiro 1992). In contrast, I find little evidence in favor of expectations derived from theories of motivated reasoning and the RAS model. In line with Hypothesis 4b, in certain cases the effect of perceived partisan consensus on preferences for counter-terrorism policies is moderated by party identity and trait authoritarianism. However, there is no evidence

that the presidential statement affects the opinions of Republicans more than those of Democrats (Hypothesis 4a) or that political awareness moderates treatment effects (Hypothesis 4c).

## **CONCLUSION**

Access to information is essential for citizens to make decisions that reflect their interests and values. This is especially important during security crises when national reputation and citizens' physical safety and liberties are on the line. In these periods, the government often implements policies whose consequences last well after a terrorist threat is removed. However, it is precisely in these circumstances that citizens find their access to relevant information to be costly and onerous. To reduce these costs and decide whether to follow or contest the initiatives of the political leadership, citizens can rely on partisan cues.

In this study, I argued that in the face of a terrorist attack, citizens change their opinions about counter-terrorism policies in an explicable manner as a function of prior beliefs, their exposure to new information, and the partisan cues they receive. To test this argument, I carried out a survey experiment with a nationally diverse sample a few weeks after the killing of the Iranian major general Qasem Soleimani in January 2020. The international crisis between the U.S. and Iran created a context that lent credibility to the experiment. Indeed, the intervention consisted of randomly exposing subjects to a fictional presidential address to the nation about an imminent terrorist attack and partisan cues that were supportive or opposing to the president's foreign policy initiatives. Apart from increasing internal validity, this experimental design offered the opportunity to investigate the counterfactual scenarios of partisan consensus and dissensus in a way previous literature, drawing mostly on observational data, has not studied extensively.

Nevertheless, the design also features certain limitations. First, subjects were exposed to cues which informed that the Democratic leadership intended to support or oppose the president's policies but did not provide any justification for this position. Indeed, offering greater detail on why the Democratic Party decided to take a given position could increase the persuasiveness of partisan cues (cf. Broockman and Butler 2017).

Second, the design allows for the study of how individuals respond to particular information and cues but does not allow them to choose the content they would like to receive. In the era of personalized newsfeeds, citizens have the choice to pay attention only to news that matter to them and views they agree with (Prior 2007). And this choice can have a detrimental impact on the likelihood of being exposed to news about foreign policy issues as citizens are generally less interested in this area of politics (Baum and Potter 2019).

The results suggest that exposure to the presidential statement increases public support for counter-terrorism policies. These policies include shutting down the borders, deporting Muslims, launching a drone strike against Iran, expanding the war on terror to Iran and other countries, and deploying troops in U.S. cities. Importantly, when exposure to the statement was accompanied by cues about the position of the leadership of the Democratic Party, the effects remained similar despite certain substantive but not significant variations. Overall, the findings allow room for optimism as individuals seem to be reluctant to support measures that directly undermine their civil liberties, or the rights of persons suspected of engaging in terrorist activities.

Further, citizens update their opinion in parallel regardless of their political predispositions and degree of political awareness. This finding corroborates the parallel public thesis put forward by Page and Shapiro (1992) and is largely inconsistent with expectations derived from motivated reasoning and the RAS model. An exception exists. Party identity and trait authoritarianism moderate responses to treatment when partisan consensus is perceived. Republicans and

authoritarians, who are already more supportive of counter-terrorism measures, resist changing their views when the Democratic leadership supports the initiatives of the president, thus implying a ceiling effect. In contrast, Democrats and individuals that score low or medium in authoritarianism increase their support for counter-terrorism measures even when they are informed that their party opposes them. However, parallel –not biased– updating is the trend that characterizes attitude change in the overwhelming majority of cases.

The findings of this study inform our understanding of how Americans respond to elite messages when terrorist threats are salient. But these results may be generalized to other aspects of foreign policy that involve threats to national security such as wars and cyberattacks. Indeed, in critical times the president has a considerable advantage over other members of the political elite and affects public preferences for counterterrorism in a decisive way. The study reports an asymmetry that is beneficial to the president: in contrast to Republicans and authoritarians, Democrats and less authoritarian citizens are more likely to follow the president regardless of the partisan cues they may receive. This suggests that, even during a period of high affective polarization, partisan animosity is reduced when national security is threatened. A hopeful caveat is that citizens are generally reluctant to support policies that endanger their civil liberties.

Future research can improve on these findings in several ways. First, further investigation is needed about whether exposure to partisan cues along with detailed justification increases the persuasiveness of cues. Second, experimental studies should explore the impact of intrapartisan disagreements. More specifically, bickering inside the president's party may reduce the impact of presidential statements while intra-party dissent in the party of opposition may result in higher reliance on presidential cues. Finally, it is crucial to study whether the public responds similarly when the executive branch is controlled by the Democratic Party or when a unified government is in place.



## **CHAPTER 2**

### **The One Where A Virus Almost Killed Us All**

#### **The Effect of Incidental Disgust and Information on Political and Health Attitudes during the COVID-19 Pandemic**

**Summary:** In the wake of the COVID-19 pandemic citizens were heavily exposed to emotionally charged information. Yet, existing research has not studied in depth the independent and joint effects of information and disgust, an innate disease-related emotion. I demonstrate that experimentally induced incidental disgust and exposure to information about how to flatten the curve of the COVID-19 cases have distinctive effects on political, racial, and health attitudes. Independently, exposure to information affects preferences only for restrictive policies to fight the spread of the virus. In contrast, the standalone effect of incidental disgust, as well as its joint effect with exposure to information, are responsible for attitude change toward both pandemic-relevant and irrelevant policies, Asian minorities, and prevention measures. Importantly, the study finds that citizens respond symmetrically to information and disgusting stimuli across degrees of political awareness, ideology, partisan affiliation, and trait authoritarianism. The results draw attention to the far-reaching implications of disgust on public opinion during the current pandemic.

The COVID-19 pandemic represents an unprecedented global health crisis. Since its emergence in December 2019 in Wuhan, China the pandemic has impacted all aspects of personal and social life across the world and will shape the way people think about themselves and their communities for decades to come. As the ongoing pandemic crisis has unfolded, the American government has had substantial room to maneuver and dominate the information environment due to expanding information asymmetries (Nacos, Bloch-Elkon, and Shapiro 2011; Page and Shapiro 1992). A variety of policies to address the unexpected shock were proposed and implemented that otherwise might have been considered controversial and even faced immediate and strong opposition. To adapt to the changing environment, ideal citizens in a democracy should increase their consumption of news and critical thinking about government responses.

However, information is rarely served “cold,” especially so during the weeks that preceded the peak of the pandemic in New York. Emotions are pivotal to how people update their perceptions of reality and respond to political stimuli, because they regulate their existential and epistemic motivations (Marcus, Neuman, and MacKuen 2000; Huddy, Feldman, and Cassese 2007; Lerner and Keltner 2001). Indeed, political elites appeal to citizens’ emotions strategically to manipulate political participation (Valentino et al. 2011) and increase support or opposition for particular policies or candidates (Jerit, Kuklinski, and Quirk 2009; Lupia and Menning 2009). Similarly, the role of emotional appeals in online and traditional media is to sensationalize information and influence the way media content is received and processed by the audience (Iyengar and Kinder 1987; Ladd and Lenz 2011; Crockett 2017; D. G. Young 2019).

This study aims to explain how disgust and information affect public attitudes toward strategies to flatten the curve of COVID-19 cases. I argue that in the wake of the current pandemic citizens update their attitudes in an explicable manner as a function of their exposure to new

information and their emotional responses to the information. However, exposure to information and appraisals of disgust change attitudes toward policies and prevention measures in distinctive ways and trigger different dynamics in opinion change.

While research in recent years has focused extensively on the importance of anger, fear, and enthusiasm in explaining public opinion and electoral behavior (Vasilopoulos et al. 2019; Parker and Isbell 2010; L. E. Young 2019), less is known about disgust, an affective appraisal that is expected to be particularly important during pandemic crises due to its role in detecting and dealing with potential contaminants (Curtis and Barra 2018). Disgust is an innate disease-related emotion. Indeed, the adaptive value of disgust is to protect the wellbeing of the human body by activating strategies to avoid or discard health threatening stimuli (Rozin and Fallon 1987).

Disgust was associated with the COVID-19 pandemic very early as scientific reports tracked the origins of the new coronavirus (SARS-CoV-2) back to consuming exotic foods such as bats (Andersen et al. 2020). In the current polarized environment, these findings have been invoked to incite hostile feelings against China and the scapegoating of Asian minorities. The reference of President Trump to the new coronavirus as a “Chinese” or “Wuhan” virus is an exemplary case of how the politics of disgust have been playing out. Similarly, the mass media racialized the pandemic by focusing on exotic foods of Asian markets and dietary habits of Asians that may be unconventional to Western audiences. Moreover, one of the most challenging aspects of the ongoing crisis has precisely been that individuals have to treat their fellow citizens as potential health threats and avoid contact with them. Perceiving others as potential contaminants imposes a severe psychological burden on individuals, erodes social cohesion, and hampers economic activity.

To study the effects of disgust and information on attitude change, I conducted a large-scale survey experiment with a nationally diverse sample of American citizens during the COVID-19 crisis in April 2020. The experimental design allows for the examination of the independent and joint impact of incidental disgust and exposure to information about how to prevent the contagion of the virus on attitudes toward restrictive policies, prevention measures, and Asian minorities.

I find that incidental disgust and exposure to information about the COVID-19 pandemic increase support for restrictive policies at the expense of civil liberties. This information exposure alone does not have any downstream effects on health and racial attitudes or other (even closely related) policy preferences, e.g., support for universal healthcare. However, incidental disgust – both alone and jointly with information, but not information independently – encourages the adoption of stricter health attitudes, increases bias against Asians, and changes preferences even for policies that are unrelated to the pandemic. Finally, I find little evidence for heterogeneous effects according to political awareness, ideology, party identity, and trait authoritarianism in all three treatment conditions and across 312 different model specifications.

## **PHYSICAL DISGUST AND THE BEHAVIORAL IMMUNE SYSTEM**

Both disgust appraisals and access to information are of paramount importance when health threats are salient. Disgust is associated with a strong impulse to avoid or discard something infective or offensive (Rozin and Fallon 1987; Rozin, Haidt, and McCauley 2008). Disgust is the affective appraisal that regulates responses of the behavioral immune system, a system that protects the wellbeing of human bodies from disease and potential contaminants (Oaten,

Stevenson, and Case 2009; Aarøe, Petersen, and Arceneaux 2017). The behavioral immune system constantly monitors surroundings for potential health threats or abnormalities. If it detects a pathogen, appraisals of disgust increase and harm-avoidance strategies are set in motion (Clifford and Wendell 2016; Nussinson, Mentser, and Rosenberg 2018).

While considerable cultural variation exists (Elwood and Olatunji 2009), Ekman (1992) has identified a universal pattern in the expression of disgust. Behaviorally, disgust motivates individuals to distance themselves from objects, ideas, or situations that are perceived as impure or indigestible. Physiologically, disgust involves nausea, a feeling of sickness and an inclination to vomit. Finally, the study of the expressive component of disgust has focused mostly on the characteristic facial expression with the gape, retraction of the upper lip, and the nose wrinkle (Ekman and Friesen 1975).

Rozin and Fallon (1987) observe that disgust is a response to “anything that reminds us that we are animals.” Indeed, cumulative research has identified five to six typical elicitors of disgust: bodily waste of living organisms (e.g. feces, mucus), physical evidence of unhygienic behavior (unpleasant odor), animals and insects (mice, cockroaches), promiscuous sexual behavior (having multiple sex partners or unconventional sexual preferences), atypical appearance (deformity, behavioral signs of illness), skin lesions (blisters, pus), and spoiled food items (Curtis and Barra 2018; Tybur et al. 2013; Tybur, Lieberman, and Griskevicius 2009).

Rozin and colleagues (Rozin and Fallon 1987; Rozin, Haidt, and McCauley 2008; Rozin, Haidt, and Fincher 2009) theorize that the origins of disgust can be found in distaste, a reflex that motivates withdrawal from objects perceived to be unhealthy or inedible. In this sense, Rozin considers disgust to be fundamentally linked with food consumption. However, recent evidence shows that food-related disgust may be indistinguishable from disgust directed toward animals or

insects and has common genetic bases with general pathogen disgust (Curtis and Barra 2018; Sherlock et al. 2016).

A competing theory posits that disgust is a withdrawal-motivating appraisal that offers the evolutionary advantage of avoiding pathogens and diseases (Tybur et al. 2013; Oaten, Stevenson, and Case 2009; Curtis, de Barra, and Aunger 2011). This approach argues that disgust can be elicited when people encounter or even, merely think about disease threats. The fact that individuals can experience disgust without the physical presence of a pathogen (which is often unobservable to the naked eye), offers a constructionist account of the origins of disgust that can explain the broader implications of disgust beyond the domain of bodily health and regarding moral, social, and political issues.

## **DISGUST IN THE MORAL AND POLITICAL DOMAIN**

Activities or behaviors that are not themselves harmful or threatening to health can become moralized if they activate mental associations with explicit disgust-eliciting stimuli (Tybur et al. 2013; Rozin, Haidt, and Fincher 2009). Martha Nussbaum (2010) notes that projecting disgust involves “sympathetic magic” in that individuals link “the allegedly disgusting group or person somehow with the primary objects of disgust.”

Pizarro, Inbar, and Helion (2011) theorize that there are three ways disgust is associated with moral judgment. First, the most controversial hypothesis is that feelings of disgust can moralize behaviors and ideas that are otherwise morally neutral. Second, disgust can be the product of perceived moral transgression, that is, when people observe a behavior or idea that is immoral, they feel disgusted. Finally, disgust can amplify moral condemnation of actions or opinions that

are perceived as immoral. Indeed, many seminal studies have found that incidental disgust can increase moral condemnation (Schnall et al. 2008; Tracy, Steckler, and Heltzel 2019; Eskine, Kacirik, and Prinz 2011; cf. Ghelfi et al. 2020). However, a recent meta-analysis of experimental studies found that incidental disgust has a minimal impact on moral judgement (Landy and Goodwin 2015). Overall, the meta-analytic results suggest that the relevant scholarship has been facing problems of low statistical power and publication bias.

In politics, both trait disgust (dubbed as *disgust sensitivity*) and the emotional state of disgust have been found to predict or explain attitudes toward a plethora of policy issues. During health crises the role of disgust becomes even more eminent. Disgust sensitivity has been found to be a strong predictor of attitudes toward Ebola and Zika (Kam 2019). Indeed, individual differences in disgust sensitivity, and in particular contamination disgust, predict higher concerns about disease outbursts and stronger support for more restrictive policies, especially for those perceived as out-groups. Clifford and Wendell (2016) offer further evidence that experimentally induced disgust leads to preferences for harsher health policies regarding vaccinations, food and environmental quality, GMOs, obesity, and drugs. In line with this literature, I expect that incidental disgust will increase support for restrictive policies at the expense of civil liberties ( $H_1$ ) and encourage the adoption of stricter health attitudes ( $H_2$ ).

Evidence from evolutionary psychology suggests that disgust sensitivity is associated with greater sensitivity of detecting morphological dissimilarities across health-related and incidental objects (Nussinson, Mentser, and Rosenberg 2018). This increased sensitivity to dissimilarity can trigger similarity bias that manifests itself in biases toward perceived out-groups. There is conflicting evidence in the literature about whether there is an asymmetry in negativity, and in particular disgust, bias across the ideological spectrum. A wealth of literature suggests that

conservatives are more disgust-sensitive than liberals using physiological (Oxley et al. 2008) as well as self-report measures (Inbar et al. 2012; Stewart, George, and Adams 2019).

However, Steiger et al. (2019) report that liberals show greater contempt, anger, disgust, and happiness biases than conservatives. Finally, a recent pre-registered direct replication and a series of conceptual replications of the seminal study of Oxley et al. (2008) failed to find any ideological asymmetries in disgust bias using physiological measures (Bakker et al. 2020). In light of this conflicting evidence, I expect that there will be but minimal asymmetries in the effect of disgust across levels of trait authoritarianism, ideology, and partisan affiliation ( $H_3$ ).

Finally, disgust sensitivity predicts support for protectionist measures across different policy domains even after controlling for personality traits, trait authoritarianism, racial resentment or moral traditionalism (Kam and Estes 2016). Disgust explains conservative attitudes toward women, same-sex marriage, and LGBTQ people (Casey 2016; Nussbaum 2010). However, Gadarian and Vort (2018) find evidence that as tolerance toward sexual minorities increases in modern societies individuals may reject disgust rhetoric as uncivil.

Disgust triggers similar biases against immigrants and racial minorities. Disgust sensitivity underlies opposition to immigration and prejudice against ethnic out-groups (Aarøe, Petersen, and Arceneaux 2017; Petersen 2019) mostly due to resistance to foreign norms, rather than perceived disease threats (Karinen et al. 2019). A darker side of disgust is its association with the dehumanization of immigrants and other out-groups (Giner-Sorolla and Russell 2019). Based upon this evidence, incidental disgust should increase biases against Asians, a racial group that has been repeatedly targeted by elite rhetoric during the pandemic ( $H_4$ ).



## DISGUST, INFORMATION, AND ATTITUDE CHANGE

Disgust affects attitudes indirectly by regulating epistemic motivations. In two experimental studies, Clifford and Jerit (2018) report consistent evidence that disgust discourages further seeking of information about disease outbursts and health threats, but increases recall of relevant information. In contrast, anxiety motivates the search for new information (see also Albertson and Gadarian 2015; Huddy, Feldman, and Cassese 2007), but its effect may be neutralized in the presence of disgusting stimuli. Further, disgust increases attitude strength when information includes cues that increase confidence whereas it reduces conviction in previously acquired beliefs when pleasant cues are present (Briñol et al. 2018).

Three major approaches seek to explain how citizens update their views when exposed to new information: Zaller's Receive-Accept-Sample (RAS) model, motivated reasoning, and the Bayesian Learning Model. Although conflicting in their predictions, each of them offers useful insights into how information and affective appraisals can interact to produce attitude change. Zaller's memory-based RAS model (1992) suggests that individuals' ability to absorb information depends on their levels of political awareness (the degree of cognitive engagement with an issue) and their political predispositions. Citizens who are either highly aware or completely ignorant about political issues and hold strong political orientations are less likely to update their opinions in light of new evidence, and only individuals who are moderately aware and have tepid views can be swayed.

A proposition of the RAS model that is particularly interesting for this study is that exposure to information related to a particular issue will increase the salience of this issue and make relevant considerations more accessible when respondents report their opinions. In line with this expectation, information about how to flatten the curve of the COVID-19 cases should only

impact relevant attitudes and have but negligible downstream effects to other health or racial attitudes, and policy preferences ( $H_5$ ). This hypothesis implies that belief systems exhibit weak dynamic constraint, that is changes in one idea-element do not stimulate changes in other idea-elements elsewhere in the configuration of political attitudes (Converse 1964), or at least exposure to issue-specific information does not *independently* affect attitudes toward other policy domains.

While the RAS model largely overlooks the role of emotions, Lodge and Taber's John Q. Public model of motivating reasoning puts them at the forefront. Lodge and Taber (Lodge and Taber 2013; Taber and Lodge 2006) put forward a dual-process model that stipulates that information processing occurs through the interaction of conscious and unconscious forces. After a stimulus event, cognition consciously processes considerations under the unconscious influence of predispositions and incidental affect.<sup>1</sup> The outputs of this procedure are rationalized arguments and evaluations which in turn update previous attitudes and beliefs. However, this update is biased in the sense that it motivates existential and epistemic needs for certainty and attitude consistency. In other words, citizens are motivated to confirm the validity of their deep-seated beliefs. In light of this evidence, the interaction of incidental disgust and exposure to information about the pandemic should increase support for restrictive policies and health measures and produce downstream effects to attitudes irrelevant to the pandemic ( $H_6$ ).

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<sup>1</sup> Kahan proposes a similar identity-centered model to explain climate change skepticism that emphasizes the motivation of individuals to preserve their cultural identities against scientific evidence (Kahan, Jenkins-Smith, and Braman 2011).

Finally, the Bayesian Learning Model suggests that attitude change occurs in a manner consistent with Bayes' rule, that is individuals update their opinions by weighting new information according to the strength of their prior beliefs (Gerber and Green 1999; Bullock 2011). While Bayesian updating is compatible with a variety of predictions, recent experimental evidence demonstrates that attitude change is durable, incremental, homogeneous, and in the direction of evidence (Coppock, Ekins, and Kirby 2018; Guess and Coppock 2018). These individual-level patterns are consistent with a rational conceptualization of the U.S. public as a collectivity that holds understandable opinions about policy issues which change predictably when exposed to new information (Page and Shapiro 1992). Accordingly, I expect that attitude change will be small and that subgroups of the population will update their opinions in parallel regardless of their levels of political awareness, ideology, partisan affiliation, and trait authoritarianism ( $H_7$ ).

## **SUMMARY OF THE ARGUMENT**

I argue that at the peak of the pandemic crisis, citizens updated their attitudes in an explicable way as a function of their exposure to new information about flattening the curve of COVID-19 cases and their emotional responses. However, exposure to information and affective appraisals of disgust are expected to produce divergent outcomes. On the one hand, incidental disgust should impact attitudes toward Asian minorities, prevention measures, and policies. On the other hand, information should independently increase only the support for restrictive measures at the expense of civil liberties. In contrast, the interaction of disgust appraisals with information about the pandemic should have downstream effects to racial and health attitudes. Finally, I expect

that individuals will update their opinions in a similar manner regardless of their political predispositions and level of political awareness.

## **RESEARCH DESIGN AND METHODS**

To empirically test my argument, I conducted a large survey experiment at the peak of the COVID-19 crisis in New York. The study ( $N = 2,458$ ) was administered with a nationally diverse sample of American citizens by Lucid from April 1 to 6, 2020.<sup>2</sup> The experiment features four arms, a placebo and three treatment groups. To increase statistical precision, a total of 995 subjects were randomly assigned to the placebo group while treatment groups 1, 2, and 3 include 490, 478, and 495 subjects, respectively.

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<sup>2</sup> Lucid is the largest marketplace for online samples in the U.S. Lucid uses quota sampling and a matching algorithm with respect to age, gender, ethnicity, race, education, income, and ZIP code to produce an Internet sample that closely approximates the marginal (but not necessarily joint) distributions of demographic characteristics for the general population of the United States as found in the most current national census. Coppock and McClellan (2019) offer a comparative evaluation of samples obtained via Lucid and MTurk using the 2012 American National Election Study as a baseline. They find that samples on Lucid have characteristics that are often similar to ANES 2012 and resemble the national population closer than their counterparts on MTurk in almost every observable demographic, political, and psychological attribute. The experimental study lasted for 15 minutes and had a completion rate of 56%. This research was reviewed and approved by the Institutional Review Board of Columbia University (IRB-AAAS9650).

## *Procedure*

Before treatment assignment, respondents were invited to complete a short pre-treatment survey to collect basic demographic information. Then, subjects were randomly assigned to one of four groups. All treatments consisted of reading a 700-word news article and watching a 2-minute clip. To collect data about the outcomes of interest, subjects filled out a survey after receiving the treatment.

In the placebo group, subjects read an article about the historical importance of oak trees and watched a news story about apple-picking season in New York. In treatment group 1, subjects read the same story but watched a clip that aimed to induce incidental disgust. In the clip, three individuals were shown eating unconventional foods such as live worms and insects. The intervention was intense as subjects had to watch the processing of live worms and then their consumption while listening to intense sounds of chewing.<sup>2</sup>

In treatment group 2, subjects read a news article that urged taking measures in order to flatten the curve of COVID-19 cases. The article originally appeared in The New York Times, but was slightly edited and all relevant cues were removed. It presented information about the deadliness of the virus and the measures people would need to take to reduce the rate of contagion.

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<sup>2</sup> In the clip, people's faces have been cropped above the nose, but subjects might have inferred their race (Asian) by either the type of food people were consuming or some other facial characteristic. To test whether the clip triggers nativist or xenophobic attitudes instead of or in addition to disgust, I conduct a series of robustness checks (Table A6). The results suggest that the treatment does not increase subjects' authoritarian preferences or anti-immigration attitudes.

Subjects also watched a video of a health worker in a New York hospital talking about the shortages in supplies and showing the dramatic conditions inside the hospital. In treatment group 3, subjects read the same article as subjects in group 2, but were exposed to the disgust-inducing clip. This design allows for the study of the independent and joint impact of information and disgust on policy preferences and health and racial attitudes.

### *Analytic Strategy*

The main estimands of interest are the Average Treatment Effect (ATE) and the Conditional Average Treatment Effect (CATE). The ATE measures the difference between the average outcome for all subjects in the placebo group and the average outcome for all subjects assigned to each treatment group separately to avoid problems with multiple comparisons. I estimate the ATE with OLS estimators. Difference-in-means estimates are obtained from a simple bivariate regression while multivariate estimators control for pre-treatment covariates. Because the balance test suggests that the design is not perfectly balanced (see Tables A1 and A2), the latter estimates should be considered more reliable. When heteroskedasticity is present, I estimate HC1 robust standard errors.

To explore variability in treatment effects, I estimate the Conditional Average Treatment Effect, that is the ATE for different subgroups. The CATE is obtained by including a treatment-by-covariate interaction in the multivariate OLS estimators to account for the conditional effect of political awareness, ideology, partisan identity, and trait authoritarianism, separately. Then, I conduct consecutive F-tests to compare the multivariate models to the interactive models.

To calculate two-tailed *p-values* for hypothesis tests I employ randomization inference. Assuming that there is no treatment effect for any unit, randomization inference (RI) uses the actual distribution of the outcome in the data to estimate the probability of observing an estimate of the ATE as extreme as the one that was actually observed, under infinite (approximated by 100,000) counterfactual random assignments.<sup>3</sup> RI is particularly useful for the analysis of the findings because many outcomes are skewed and violate the normality assumption that traditional estimators make. I obtain the two-tailed *p-values* associated with the CATE in a similar manner, assuming that all units have a constant effect (Gerber and Green 2012).

## ***Measures***

Prior to treatment assignment, subjects filled out a short survey with questions about their demographic characteristics, political interest, ideology, partisan identity, and trait authoritarianism. I operationalize political awareness by constructing a composite scale of education and political interest (Zaller 1992). Accordingly, I measure trait authoritarianism by adding four items measuring child-rearing values.

The post-treatment survey included measures for policy preferences and health and racial attitudes. All outcomes were measured with a 7-point scale and all variables were rescaled to range from 0 to 1.

I tapped into support for restrictive policies at the expense of civil liberties in order to reduce the spread of the virus with five measures taken and adapted from Albertson and Gadarian (2015). Subjects were asked how much they favored or opposed to requiring a person to have a

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<sup>3</sup> To conduct randomization inference in R, I used the *ri2* package (Coppock 2019).

medical exam, quarantining a person potentially exposed to the virus, and requiring a patient to be isolated under the threat of arrest. Moreover, subjects expressed their support for requiring hospitals to cure potential patients even if they did not accept them and destroying personal effects that might be contaminated by the coronavirus. I also measured policy preferences for same-sex marriage, abortion rights, gun control, death penalty, increasing taxes for the rich, implementing a universal healthcare program, deporting immigrants, and shutting down the borders.

I study health attitudes with four items that measured how likely it was that the respondent would more frequently wash her hands for more than 20 seconds, wear a mask, cover her mouth and nose with a tissue when coughing or sneezing, and cough or sneeze into her elbow or shoulder. Further, I tapped into attitudes toward Asian minorities by asking how much the respondent supported preemptively quarantining Asian people under the threat of arrest, and how likely was that she would avoid contact with Asian people, visiting areas populated by Asian people, and eating Asian food.

At the end of the survey, subjects were asked to report on a 7-point scale whether they were feeling disgusted, grossed out, repulsed, angry, bitter, resentful, anxious, afraid, scared, proud, enthusiastic, hopeful, and sad. Results from principal axis factoring with *promax* rotation suggest that five factors underlie these items (see Table A3). Accordingly, I add the respective items to create four scales for disgust (*Cronbach's alpha* = 0.872), anger ( $\alpha$  = 0.855), fear ( $\alpha$  = 0.893) and enthusiasm ( $\alpha$  = 0.753). Sadness is measured with a single item, which loads to a distinct factor.



## EMPIRICAL RESULTS

I begin the analysis by focusing on the results of the manipulation test (see Tables A4 and A5). The disgust treatment increases feelings of disgust by 11.4 percentage points (two-tailed  $p$ -value  $< 0.001$ ), but does not affect anger, anxiety, anger, enthusiasm, or sadness after controlling for covariates (all  $ps > 0.255$ ). Subjects exposed to information about the health risks of the pandemic feel sadder ( $\widehat{ATE} = 0.086$ ,  $p < 0.001$ ), more anxious ( $\widehat{ATE} = 0.042$ ,  $p = 0.017$ ) and angry ( $\widehat{ATE} = 0.032$ ,  $p = 0.082$ ), and less enthusiastic ( $\widehat{ATE} = -0.041$ ,  $p = 0.007$ ). The fact that exposure to information does not affect disgust appraisals ( $\widehat{ATE} = 0.011$ ,  $p = 0.53$ ) offers analytical leverage to study responses in the absence of such feelings. Finally, in the condition where subjects were exposed to both information and disgusting stimuli only feelings of disgust are impacted ( $\widehat{ATE} = 0.144$ ,  $p < 0.001$ ).

I structure the remainder of the analysis as follows. I begin by reporting the direct and joint causal effects of disgust and information on support for restrictive policies at the expense of civil liberties. I then focus on health and racial attitudes, and public support for policies not directly related to the pandemic. Overall, the estimates of the ATE suggest that attitude change is medium to small in size and treatments affect attitudes positively by 2.2-11.6 percentage points. Finally, I explore heterogeneous effects of the treatments across levels of political awareness, ideology, partisan affiliation, and trait authoritarianism.

### *Preventive Policies vs. Civil Liberties*

This section reports tests for the direct and joint effects of disgust and information on public preferences for strict measures to curb the contagion rate of COVID-19. All tables are divided in three parts to present the impact of each treatment on the outcome of interest. The first row in each part reports the  $\widehat{ATE}$  and the second reports estimated standard errors from OLS regressions, adjusted for heteroskedasticity when necessary. The third row presents two-tailed  $p$ -values calculated with randomization inference. The fourth and fifth rows present the intercept and the respective standard errors from OLS regressions. The last two rows inform about whether the model controls for pretreatment covariates and sample size, respectively.

Table 1 presents the impact of treatments on support for drastic measures that are in conflict with civil liberties. Subjects were asked whether they would support forcing a person to have a medical exam, quarantining people suspected of having been exposed to the coronavirus, and requiring people who actually have coronavirus to be isolated with other patients under the threat of arrest. Independently, incidental disgust has no impact on support for any of these measures (all  $p$ s  $> 0.13$ ). However, incidental disgust jointly with reading information about the deadliness of COVID-19 increases support for forcing people to have medical exams ( $\widehat{ATE} = 0.048$ ,  $p = 0.023$ ).

Table 2.1 The direct and joint effects of disgust and information on preferences for restrictive policies at the expense of civil liberties

Restrictive Policies vs. Civil Liberties (1)						
	Force people to take medical exams		Quarantine people		Isolate patients	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>						
ATE	0.025	0.031	0.021	0.027	0.016	0.008
(SE)	(0.019)	(0.021)	(0.018)	(0.020)	(0.019)	(0.020)
<i>RI p-value</i>	<i>0.195</i>	<i>0.133</i>	<i>0.263</i>	<i>0.154</i>	<i>0.395</i>	<i>0.693</i>
Intercept	0.576	0.49	0.658	0.497	0.645	0.578
(SE)	(0.011)	(0.045)	(0.011)	(0.043)	(0.011)	(0.044)
Covariates	No	Yes	No	Yes	No	Yes
N	1410	1178	1416	1185	1409	1174
<b>I</b> <i>Treatment Group 2 : Information</i>						
ATE	0.051	0.044	0.04	0.035	0.052	0.038
(SE)	(0.020)	(0.022)	(0.018)	(0.02)	(0.018)	(0.021)
<i>RI p-value</i>	<i>0.009</i>	<i>0.040</i>	<i>0.031</i>	<i>0.086</i>	<i>0.004</i>	<i>0.068</i>
Intercept	0.576	0.493	0.658	0.531	0.645	0.576
(SE)	(0.011)	(0.046)	(0.011)	(0.042)	(0.011)	(0.043)
Covariates	No	Yes	No	Yes	No	Yes
N	1381	1161	1400	1170	1385	1155
<i>Treatment Group 3 : Information x Disgust</i>						
ATE	0.047	0.048	0.011	0.017	0.012	0.016
(SE)	(0.019)	(0.021)	(0.018)	(0.020)	(0.019)	(0.020)
<i>RI p-value</i>	<i>0.014</i>	<i>0.023</i>	<i>0.523</i>	<i>0.379</i>	<i>0.522</i>	<i>0.425</i>
Intercept	0.576	0.518	0.658	0.489	0.645	0.566
(SE)	(0.011)	(0.044)	(0.011)	(0.042)	(0.011)	(0.043)
Covariates	No	Yes	No	Yes	No	Yes
N	1403	1183	1413	1188	1410	1183

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 2.2 The direct and joint effects of disgust and information on preferences for restrictive policies at the expense of civil liberties (continued)

	Restrictive Policies vs. Civil Liberties (2)			
	Force hospitals to cure patients		Destroy personal belongings	
	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>				
ATE	0.032	0.039	0.066	0.049
(SE)	(0.014)	(0.015)	(0.022)	(0.023)
<i>RI p-value</i>	<i>0.024</i>	<i>0.012</i>	<i>0.002</i>	<i>0.036</i>
<u>Intercept</u>	0.778	0.699	0.456	0.457
(SE)	(0.008)	(0.034)	(0.012)	(0.05)
Covariates	No	Yes	No	Yes
N	1403	1170	1330	1115
<i>Treatment Group 2 : Information</i>				
ATE	-0.022	-0.019	0.106	0.085
(SE)	(0.015)	(0.017)	(0.021)	(0.023)
<i>RI p-value</i>	<i>0.144</i>	<i>0.247</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>
<u>Intercept</u>	0.778	0.677	0.456	0.385
(SE)	(0.008)	(0.034)	(0.012)	(0.048)
Covariates	No	Yes	No	Yes
N	1385	1162	1312	1105
<i>Treatment Group 3 : Information x Disgust</i>				
ATE	0.016	0.025	0.060	0.057
(SE)	(0.015)	(0.016)	(0.022)	(0.023)
<i>RI p-value</i>	<i>0.274</i>	<i>0.124</i>	<i>0.004</i>	<i>0.013</i>
<u>Intercept</u>	0.778	0.729	0.456	0.417
(SE)	(0.008)	(0.033)	(0.012)	(0.049)
Covariates	No	Yes	No	Yes
N	1401	1181	1330	1126

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

In contrast, exposure to information seems to have a more important role in activating preferences for restrictive measures. Information about the health risks of the global pandemic increases support for requiring people to have medical exams ( $\widehat{ATE} = 0.044$ ,  $p = 0.04$ ), but its effects on preferences for quarantining potentially infected people ( $\widehat{ATE} = 0.035$ ,  $p = 0.086$ ) and isolating patients ( $\widehat{ATE} = 0.038$ ,  $p = 0.068$ ) do not achieve statistical significance at the conventional 0.05 level. Nevertheless, these effects are still noteworthy given that the proposed measures were particularly severe in that disobedient citizens were threatened with being arrested.

Table 2 presents the results from two additional tests that correspond to less strict but still aggressive policies. Incidental disgust increases public support for destroying personal belongings that might be contaminated by the virus ( $\widehat{ATE} = 0.049$ ,  $p = 0.036$ ) and requiring hospitals and health clinics to provide services to people who think they may have the coronavirus, even if a hospital or clinic does not want to provide them ( $\widehat{ATE} = 0.039$ ,  $p = 0.012$ ). Further, information about the pandemic increases support for destroying contaminated personal belongings, both independently ( $\widehat{ATE} = 0.085$ ,  $p < 0.001$ ) and in conjunction with disgusting stimuli ( $\widehat{ATE} = 0.057$ ,  $p = 0.013$ ).

Overall, findings offer evidence in favor of Hypotheses 1 and 5. Indeed, incidental disgust and exposure to information increase support for restrictive policies at the expense of civil liberties. A caveat is important. Treatments primarily affect attitudes toward less severe measures, that is measures that do not include the penalty of arrest. An explanation could be that preferences for restrictive policies at the expense of civil liberties are based on deeply-seated beliefs and identity concerns that transcend contextual factors. An alternative explanation is that even more intense treatments are needed for such extreme preferences to be affected.

## *Health Attitudes*

I now turn my focus to the direct and joint effects of incidental disgust and information about the COVID-19 pandemic on attitudes toward prevention measures. Outcomes measure attitudes toward washing hands with soap and water for at least 20 seconds, covering mouth and nose with a tissue when coughing or sneezing, coughing or sneezing into elbow or shoulder, and wearing a mask in public. Table 3 presents the results of these tests.

A preliminary finding of interest is that the baseline levels of adopting these attitudes are extremely high. Indeed, the intercepts of the difference-in-means models suggest that at the peak of the pandemic, untreated subjects adopted these health measures on average at a rate of 88.6-93.4%, with the exception of wearing a mask in public (59.1%). These extreme average outcomes in the placebo group provide a strong test for the hypothesis that incidental disgust affects health attitudes since attitude change occurs *at the margin*.

Indeed, evidence offers support for Hypotheses 2 and 6 by indicating that incidental disgust encourages the adoption of stricter health attitudes, but only when individuals are also exposed to information about the COVID-19 pandemic. The joint treatment of reading about the risks of the virus and watching the disgust-inducing clip increases the propensity of subjects to cover their mouth when coughing ( $\widehat{ATE} = 0.023$ ,  $p = 0.014$ ), and wear a mask in public ( $\widehat{ATE} = 0.059$ ,  $p = 0.005$ ). Independently, the effect of incidental disgust increases the propensity to cover the mouth when coughing, but marginally fails to reach statistical significance at the 0.05 level ( $\widehat{ATE} = 0.022$ ,  $p = 0.056$ ). Finally, information about the pandemic solely does not affect any health attitudes (all  $p > 0.114$ ) providing support for Hypothesis 5, that issue-specific information affects only closely related attitudes. These results suggest that emotions, but not necessarily information, play an important adaptive role during major health crises.

Table 2.3 The direct and joint effects of disgust and information on health attitudes

	Health Attitudes							
	Wash hands		Cover your mouth		Cough/sneeze into elbow/shoulder		Wear a mask	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>								
ATE	0.0003	-0.004	0.019	0.022	0.005	-0.001	0.027	0.017
(SE)	(0.009)	(0.009)	(0.011)	(0.011)	(0.012)	(0.013)	(0.019)	(0.021)
<i>RI p-value</i>	<i>0.979</i>	<i>0.705</i>	<i>0.08</i>	<i>0.056</i>	<i>0.723</i>	<i>0.935</i>	<i>0.142</i>	<i>0.436</i>
<u>Intercept</u>	0.934	0.856	0.895	0.816	0.886	0.818	0.591	0.501
(SE)	(0.005)	(0.020)	(0.006)	(0.025)	(0.007)	(0.028)	(0.011)	(0.045)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1467	1216	1464	1215	1464	1215	1446	1200
<i>Treatment Group 2 : Information</i>								
ATE	0.002	0.002	0.012	0.012	0.009	-0.002	0.042	0.034
(SE)	(0.008)	(0.009)	(0.011)	(0.011)	(0.012)	(0.013)	(0.019)	(0.021)
<i>RI p-value</i>	<i>0.787</i>	<i>0.784</i>	<i>0.290</i>	<i>0.313</i>	<i>0.496</i>	<i>0.842</i>	<i>0.033</i>	<i>0.114</i>
<u>Intercept</u>	0.934	0.855	0.895	0.833	0.886	0.817	0.591	0.498
(SE)	(0.005)	(0.018)	(0.006)	(0.025)	(0.007)	(0.028)	(0.011)	(0.044)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1455	1205	1451	1204	1452	1203	1430	1188
<i>Treatment Group 3 : Information x Disgust</i>								
ATE	0.006	0.010	0.023	0.028	0.022	0.014	0.064	0.059
(SE)	(0.009)	(0.008)	(0.010)	(0.011)	(0.011)	(0.012)	(0.019)	(0.020)
<i>RI p-value</i>	<i>0.477</i>	<i>0.242</i>	<i>0.030</i>	<i>0.010</i>	<i>0.052</i>	<i>0.274</i>	<i>&lt;0.001</i>	<i>0.005</i>
<u>Intercept</u>	0.934	0.872	0.895	0.832	0.886	0.838	0.591	0.500
(SE)	(0.005)	(0.018)	(0.006)	(0.024)	(0.007)	(0.027)	(0.011)	(0.043)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1468	1221	1464	1220	1467	1222	1440	1202

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

### *Attitudes toward Asians*

This section reports evidence about how disgust and pandemic-relevant information affected attitudes toward Asian people at the peak of the health crisis in New York. Table 4 presents the results. Exposure to disgusting stimuli increases attitudes toward avoiding contact with Asian people ( $\widehat{ATE} = 0.041$ ,  $p = 0.062$ ), motivates individuals to keep away from areas populated by Asian people ( $\widehat{ATE} = 0.053$ ,  $p = 0.026$ ) and avoid eating Asian food ( $\widehat{ATE} = 0.097$ ,  $p < 0.001$ ). Most worryingly, incidental disgust increases public support to preemptively quarantine Asian people under the threat of arrest ( $\widehat{ATE} = 0.045$ ,  $p = 0.036$ ). This finding, combined with the reluctance of the public to endorse similar policies for the entire population (see Table 1), resonates with previous evidence about the role of disgust in inciting prejudice against perceived outgroups (Kam 2019).

Information about the deadliness of COVID-19 independently does not affect racial attitudes (all  $ps > 0.171$ ), corroborating Hypothesis 5 for the minimal impact of information on coordinating attitude change. However, exposure to both information and disgusting stimuli fuels anti-Asian bias by increasing support to quarantine Asians ( $\widehat{ATE} = 0.05$ ,  $p = 0.014$ ), and attitudes toward reducing contact with Asian people ( $\widehat{ATE} = 0.048$ ,  $p = 0.029$ ), avoiding areas frequented by Asians ( $\widehat{ATE} = 0.061$ ,  $p = 0.012$ ), and eating Asian food ( $\widehat{ATE} = 0.116$ ,  $p < 0.001$ ). The effects of incidental disgust are stronger for attitudes involving gustatory senses.



Table 2.4 The direct and joint effects of disgust and information on racial attitudes

	Attitudes toward Asians							
	Preemptively quarantine Asian people		Avoid contact with Asians		Avoid visiting areas populated by Asian people		Avoid eating Asian food	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>								
ATE	0.037	0.045	0.035	0.041	0.046	0.053	0.093	0.097
(SE)	(0.020)	(0.021)	(0.021)	(0.022)	(0.023)	(0.024)	(0.021)	(0.022)
<i>RI p-value</i>	<i>0.065</i>	<i>0.036</i>	<i>0.103</i>	<i>0.062</i>	<i>0.043</i>	<i>0.026</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>
<u>Intercept</u>	0.269	0.113	0.305	0.146	0.378	0.227	0.263	0.137
(SE)	(0.011)	(0.045)	(0.012)	(0.047)	(0.013)	(0.052)	(0.012)	(0.047)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1386	1159	1399	1163	1384	1155	1415	1177
<i>Treatment Group 2 : Information</i>								
ATE	0.012	0.025	0.005	0.024	0.018	0.031	0.03	0.031
(SE)	(0.020)	(0.021)	(0.021)	(0.023)	(0.023)	(0.024)	(0.021)	(0.022)
<i>RI p-value</i>	<i>0.544</i>	<i>0.253</i>	<i>0.805</i>	<i>0.309</i>	<i>0.442</i>	<i>0.208</i>	<i>0.153</i>	<i>0.171</i>
<u>Intercept</u>	0.269	0.14	0.305	0.127	0.378	0.213	0.263	0.17
(SE)	(0.011)	(0.046)	(0.012)	(0.048)	(0.013)	(0.051)	(0.012)	(0.046)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1373	1152	1380	1143	1371	1142	1401	1166
<i>Treatment Group 3 : Information x Disgust</i>								
ATE	0.032	0.050	0.024	0.048	0.041	0.061	0.097	0.116
(SE)	(0.020)	(0.021)	(0.022)	(0.023)	(0.023)	(0.024)	(0.021)	(0.022)
<i>RI p-value</i>	<i>0.110</i>	<i>0.014</i>	<i>0.275</i>	<i>0.029</i>	<i>0.076</i>	<i>0.012</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>
<u>Intercept</u>	0.269	0.129	0.305	0.173	0.378	0.277	0.263	0.179
(SE)	(0.011)	(0.043)	(0.012)	(0.048)	(0.013)	(0.051)	(0.012)	(0.046)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1392	1173	1396	1165	1385	1159	1409	1177

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

In line with Hypothesis 4 and 6, I have demonstrated that incidental disgust reinforces, both independently and combined with information, prejudice against Asians, a racial minority that has suffered numerous xenophobic attacks since the outburst of the COVID-19 pandemic. Overall, the evidence suggests that information independently had minimal effects on attitude change at the peak of the pandemic. Exposure to information about the health risks of the virus and the measures that need to be taken in order to flatten the curve of COVID-19 cases affected only attitudes toward restrictive policies, but had no downstream effects on health and racial attitudes. In contrast, incidental disgust motivated individuals to update their views on a plethora of issues related to the pandemic. Indeed, exposure to incidental disgust, both independently and jointly with information, increased support for preventive measures at the expense of civil liberties, encouraged the adoption of stricter health attitudes, and incited bias against Asian minorities.

### ***General Policy Preferences***

To further study the downstream effects of exposure to information and disgusting stimuli, this section reports tests for policies that are not directly related to the pandemic. Table 5 presents the results. Incidental disgust strengthens public support for universal healthcare ( $\widehat{ATE} = 0.047$ ,  $p = 0.01$ ), but does not affect attitudes toward gun control and increasing taxes for the rich ( $ps > 0.289$ ). An interesting finding is that incidental disgust does not spur bias against homosexuals, if anything results suggest that it slightly increases support for same-sex marriage ( $\widehat{ATE} = 0.037$ ,  $p = 0.068$ ).

Once again, I find no evidence that exposure to information about the pandemic has any downstream effects even on attitudes toward universal healthcare that are somewhat relevant to

the pandemic (all  $p$ s > 0.124). However, information jointly with disgusting stimuli increases support for higher taxes for the rich ( $\widehat{ATE} = 0.042$ ,  $p = 0.025$ ). While the effect on preferences for a universal healthcare system point to the expected direction, it does not achieve statistical significance at the conventional 0.05 level ( $\widehat{ATE} = 0.031$ ,  $p = 0.093$ ).

Table 6 presents tests for four more policies. Watching the disgust-inducing clip increases support protective measures such as shutting down the borders ( $\widehat{ATE} = 0.043$ ,  $p = 0.032$ ) and reinforces public demands for deporting immigrants ( $\widehat{ATE} = 0.035$ ,  $p = 0.087$ ). Surprisingly, but in line with the above findings about taxing the rich and same-sex marriage, incidental disgust makes individuals more liberal toward abortion rights ( $\widehat{ATE} = 0.048$ ,  $p = 0.018$ ). Although disgust jointly with information does not affect any attitudes (all  $p$ s > 0.256), information independently stimulates preferences for border closure ( $\widehat{ATE} = 0.038$ ,  $p = 0.037$ ).

Taken together, evidence so far provides strong support for the argument that emotions rather than information coordinate attitude change in a health crisis. Indeed, with the exception of attitudes toward border control, information impacts only attitudes toward policies to fight the pandemic but does not have any downstream effects on any other policy preferences (Hypothesis 5). In contrast, incidental disgust motivates individuals to change their opinions, often in conflicting ways, on a wide range of issues that may be completely unrelated to the ongoing health crisis (Hypothesis 6).

Table 2.5 The direct and joint effects of disgust and information on preferences for policies

	Policy Preferences (1)							
	Gay marriage		Gun control		Increase taxes for the rich		Universal healthcare program	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>								
ATE	0.053	0.037	0.034	0.010	0.048	0.020	0.068	0.047
(SE)	(0.021)	(0.020)	(0.021)	(0.020)	(0.018)	(0.018)	(0.019)	(0.018)
<i>RI p-value</i>	<i>0.014</i>	<i>0.068</i>	<i>0.118</i>	<i>0.608</i>	<i>0.008</i>	<i>0.289</i>	<i>&lt;0.001</i>	<i>0.010</i>
Intercept	0.664	1.052	0.592	0.692	0.700	0.921	0.669	1.045
(SE)	(0.013)	(0.044)	(0.013)	(0.043)	(0.011)	(0.04)	(0.012)	(0.04)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1399	1170	1429	1197	1388	1163	1418	1185
<i>Treatment Group 2 : Information</i>								
ATE	0.031	-0.003	0.030	-0.011	0.010	-0.006	0.044	0.029
(SE)	(0.022)	(0.021)	(0.022)	(0.020)	(0.019)	(0.019)	(0.021)	(0.019)
<i>RI p-value</i>	<i>0.168</i>	<i>0.818</i>	<i>0.179</i>	<i>0.602</i>	<i>0.601</i>	<i>0.781</i>	<i>0.034</i>	<i>0.124</i>
Intercept	0.664	1.092	0.592	0.736	0.700	0.939	0.669	1.043
(SE)	(0.013)	(0.044)	(0.013)	(0.043)	(0.011)	(0.04)	(0.012)	(0.041)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1392	1167	1407	1182	1380	1158	1396	1170
<i>Treatment Group 3 : Information x Disgust</i>								
ATE	0.002	-0.020	0.021	0.006	0.047	0.042	0.045	0.031
(SE)	(0.022)	(0.020)	(0.021)	(0.020)	(0.018)	(0.018)	(0.020)	(0.018)
<i>RI p-value</i>	<i>0.917</i>	<i>0.324</i>	<i>0.333</i>	<i>0.863</i>	<i>0.012</i>	<i>0.025</i>	<i>0.027</i>	<i>0.093</i>
Intercept	0.664	1.035	0.592	0.745	0.700	0.928	0.669	1.079
(SE)	(0.013)	(0.044)	(0.013)	(0.042)	(0.011)	(0.039)	(0.012)	(0.04)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1392	1177	1427	1205	1389	1173	1408	1187

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 2.6 The direct and joint effects of disgust and information on preferences for policies (continued)

	Policy Preferences (2)							
	Death penalty		Abortion rights		Deport immigrants		Shut down the borders	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>								
ATE	-0.010	0.009	0.080	0.048	0.009	0.035	0.002	0.043
(SE)	(0.021)	(0.021)	(0.023)	(0.021)	(0.021)	(0.020)	(0.021)	(0.020)
<i>RI p-value</i>	<i>0.659</i>	<i>0.714</i>	<i>&lt;0.001</i>	<i>0.018</i>	<i>0.652</i>	<i>0.087</i>	<i>0.937</i>	<i>0.032</i>
<u>Intercept</u>	0.605	0.337	0.523	1.018	0.396	0.149	0.601	0.187
(SE)	(0.012)	(0.047)	(0.013)	(0.045)	(0.012)	(0.044)	(0.012)	(0.043)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1337	1134	1383	1160	1382	1163	1404	1173
<i>Treatment Group 2 : Information</i>								
ATE	0.015	0.028	0.055	0.021	-0.010	0.021	0.004	0.038
(SE)	(0.021)	(0.021)	(0.023)	(0.020)	(0.021)	(0.021)	(0.022)	(0.019)
<i>RI p-value</i>	<i>0.492</i>	<i>0.187</i>	<i>0.016</i>	<i>0.309</i>	<i>0.625</i>	<i>0.319</i>	<i>0.867</i>	<i>0.037</i>
<u>Intercept</u>	0.605	0.291	0.523	1.012	0.396	0.143	0.601	0.158
(SE)	(0.012)	(0.046)	(0.013)	(0.043)	(0.012)	(0.044)	(0.012)	(0.042)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1342	1138	1377	1160	1362	1156	1386	1164
<i>Treatment Group 3 : Information x Disgust</i>								
ATE	0.003	0.022	0.028	-0.002	-0.007	0.021	-0.001	0.018
(SE)	(0.022)	(0.021)	(0.023)	(0.021)	(0.021)	(0.02)	(0.022)	(0.019)
<i>RI p-value</i>	<i>0.899</i>	<i>0.304</i>	<i>0.234</i>	<i>0.897</i>	<i>0.740</i>	<i>0.256</i>	<i>0.971</i>	<i>0.314</i>
<u>Intercept</u>	0.605	0.316	0.523	0.98	0.396	0.113	0.601	0.103
(SE)	(0.012)	(0.046)	(0.013)	(0.044)	(0.012)	(0.042)	(0.012)	(0.042)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1349	1142	1375	1162	1377	1162	1402	1179

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

## *Heterogeneous Effects*

In this section, I focus on heterogeneous effects according to attributes identified by previous research as critical moderators of attitude change and emotional responses: political awareness, ideology, partisan affiliation, and trait authoritarianism. To explore heterogeneous effects, I estimate 312 conditional models (four models for each outcome in each treatment arm) and conduct an equal number of F-tests to test whether models with interactions fit the data better than the nested non-interactive multivariate models (results are presented in Tables B1-B6). Overall, the evidence suggests that the magnitude of heterogeneous effects is minimal and subgroups of the population update their opinions in parallel (Erikson, MacKuen, and Stimson 2002; Page and Shapiro 1992).

Political awareness, with all its different conceptualizations and operationalizations, has been repeatedly found to increase the constraint of belief systems and influence opinion formation and attitude change (Converse 1964; Zaller 1992). While there is theoretical disagreement on exactly how political awareness affects the propensity to update beliefs, the exploratory analysis finds little evidence that political awareness moderates the effects of treatments: only 5 out of 78 F-tests yield statistically significant results at the 0.05 level. Indeed, in most cases, sophisticated citizens are equally prone to update their opinions with their politically innocent counterparts. Importantly, disgust affects attitude change in a similar manner across degrees of political awareness.

Ideology and party identity are two important factors that shape political preferences. There is a fervent scholarly debate about whether liberals and conservatives display symmetric or asymmetric partisan bias and how these disparities impact their attitudes (Baron and Jost 2019;

Ditto et al. 2018). I investigate whether ideology moderates the effect of treatments on outcomes and find little support. Across 78 comparisons, only three F-values are associated with a p-value lower than 0.05. In other words, liberals and conservatives do not differ in the way they update their opinions when exposed to treatments. I find similar results across levels of partisan affiliation (only 6 out of 78 tests produce F-values significant at the 0.05). Citizens' responses to treatments are homogeneous regardless of their ideological beliefs, partisan identity, and whether the treatment involves information, disgusting stimuli or a combination of the two.

Finally, I explore heterogeneous effects with respect to authoritarianism, a trait that has been found to predict many political attitudes and even consumer preferences (Hetherington and Weiler 2018). Again, I find weak evidence that trait authoritarianism moderates the effect of information and emotional responses on attitudes toward pandemic-relevant and irrelevant policies, prevention measures, and bias against Asian minorities. Across 78 tests, only two F-values are statistically significant.

Overall, these findings offer strong support for Hypothesis 3, that individuals respond to disgusting stimuli symmetrically, and Hypothesis 7, that attitude change is homogeneous. Therefore, citizens do not display significant differences in the way they update their views, and disgusting stimuli cause political responses in an indistinguishable manner across levels of political awareness, ideology, party identity, and trait authoritarianism.

## **CONCLUSION**

An informed citizenry is essential to the democratic process, and especially so during major health crises. Access to information has been of paramount importance for individuals to adapt

their daily habits to the new reality imposed by the COVID-19 pandemic, and to navigate through the politics of the crisis response. However, information-processing and attitude change rarely occur in a psychological vacuum. Emotions affect political reasoning (Clifford and Jerit 2018; Huddy, Feldman, and Cassese 2007) and shape preferences for policies in critical periods (Albertson and Gadarian 2015). The adaptive value of disgust, an innate disease-related emotion, is particularly relevant during pandemics because it stimulates the behavioral immune system to activate its repertoire of avoidance strategies (Aarøe, Petersen, and Arceneaux 2017).

In this study, I argued that citizens update their opinions in a predictable manner as a function of their exposure to new information about flattening the curve of COVID-19 cases and their emotional responses. To test this argument, I conducted a survey experiment with a nationally diverse sample at the peak of the COVID-19 crisis. This survey experiment is the largest individual study to date that tests the impact of incidental disgust on attitudes toward policies, prevention measures, and racial minorities. Importantly, the survey experiment study tracked changes in opinions as they were actually occurring in the real world and offered insights into the causal underpinnings of these changes.

Experimentally studying the effects of incidental disgust allows me to identify the particular emotion of disgust and improves the internal validity of my argument. However, a limitation of the study is that citizens are not often exposed to disgusting stimuli similar to the one that subjects watched during the survey experiment. In politics, emotions usually draw on specific contexts and are politically charged. Yet, as communication strategies evolve political messages become more implicit. A recent example is Ted Cruz's dog-whistling advertisement that depicts immigrants as a scorpion that wanders in the desert. Seemingly innocuous uses of incidental emotions can have detrimental political consequences for minorities and public health.



The results of the experiment suggest that exposure to information about the deadliness of the virus has limited impact on attitudes and only affects opinions about the restrictive measures that need to be taken in order to flatten the curve of COVID-19 cases. Exposure to information may be more influential in the earlier stages of a pandemic, but as the elasticity of reality increases (Baum and Groeling 2010), the marginal returns from consuming information decrease.

In contrast, incidental disgust, both independently and jointly with information, affects a plethora of attitudes. Treatments involving disgusting stimuli motivate individuals to adopt stricter health attitudes and increase public support for severe prevention policies. These findings offer a cautiously optimistic outlook about the persistence of public support for fundamental civil liberties during challenging periods because citizens were reluctant to change their views about exceptionally punitive measures. However, incidental disgust produced negative societal results by inciting racial bias against Asians, a minority that has been targeted since the beginning of the pandemic. In a period of unprecedented racial tensions, it is imperative to mitigate the stigmatization of minorities, which has historically led to disastrous consequences (Voigtländer and Voth 2012).

Moreover, exposure to disgusting stimuli increases demands for universal healthcare and border closure. Surprisingly, I find that incidental disgust has a positive impact on attitudes toward taxing the rich, same-sex marriage, and abortion rights. Although mediation analysis is beyond the scope of this study and involves heroic methodological assumptions (Bullock, Green, and Ha 2010), these findings suggest that there may be an underlying mechanism through which disgust appraisals can increase “disgust tolerance,” rather than sensitivity, in certain cases. An alternative explanation is that as Americans become culturally open, feelings of disgust are redirected to intolerant views. Future research should explore these dynamics more closely.

Finally, I find little evidence that political awareness and political predispositions moderate how individuals update their views when exposed to information or disgusting stimuli. This implies that divergence in attitudes between segments of the citizenry should not be attributed to asymmetries in responding to cognitive and emotional stimuli, but rather to selection biases with regard to the media content that individuals choose to consume (Prior 2007; Krosnick and Macinnis 2015).

This study suggests that trying to change minds is still a worthwhile, albeit complex, enterprise in the current climate of partisan and affective polarization. There are two important caveats here. On the one hand, the impact of information on changing citizens' minds should not be overestimated. Exposure to information about the pandemic only affected attitudes toward relevant policies. On the other hand, the role of emotions should not be underestimated in the way individuals respond over a broad spectrum of issues during such a time of heightened health risk and startling partisan and ideological conflict. Future research is needed to delve deeper into how cognition interlaces with emotions to produce political attitudes that help citizens adapt to the challenging landscape of the post-pandemic era.

## CHAPTER 3

### The One Where The Sky Almost Fell On Our Heads

#### The Effect of Ideological and Non-Ideological Frames on Public Support for Environmental Policies

**Summary:** Persuading citizens to adopt environmentally friendly attitudes represents a challenge for political and science communication. I use a survey experiment fielded during the 2020 Atlantic hurricane season to test whether randomly exposing individuals to ideological and non-ideological frames of climate change affects environmental beliefs and preferences for long-term environmental policies and disaster relief measures. I demonstrate that information about climate change reinforces environmental attitudes but its persuasiveness depends on how the issue is framed. Exposure to a conservative, Christian frame of climate change or to scientific (non-political) facts increases preferences for environmental policies. In contrast, framing climate change as a racial justice (liberal) issue fails at moving public opinion even among liberal receivers. The results suggest that for environmental messages to be persuasive they need to be framed in a manner that is, at a minimum, non-threatening to conservative values. However, when messages are persuasive, citizens update their opinions in parallel regardless of their degree of education, political awareness, ideology, party identity, or trait authoritarianism.

Is there a way to escape from the unfolding tragedy of the environmental commons? Fighting climate change is a classic example of the tragedy of the commons in that citizens and states have little incentive to refrain from abusing a public good. Indeed, political leaders who seek reelection often neglect to invest resources and efforts in environmental issues that are characterized by low salience and high polarization and technical complexity (Egan and Mullin 2017). The fact that strong government interventions are necessary to coordinate these efforts and that, if these efforts are proven fruitful, people will never be able to fully appreciate the long-term damage that has been avoided makes the environmental agenda even less appealing to politicians who seek to maximize their chances of being reelected.

Contrary to other countries, the exceptionally high politicization of climate change in the U.S. has made its mitigation a contentious issue (E. K. Smith and Mayer 2018; Hornsey et al. 2016; Tesler 2018). Although a majority of citizens agrees that climate change is happening, Americans are polarized in their beliefs about its origins as well as on what policies are more effective in overcoming the environmental crisis (Leiserowitz et al. 2019; MacInnis and Krosnick 2020a; 2020b). Liberals and Democrats are more likely to express opinions consistent with the scientific consensus than are conservatives and Republicans (Van Boven, Ehret, and Sherman 2018; McCright and Dunlap 2011; Abeles et al. 2019; Hornsey et al. 2016). Similarly, personality traits, worldviews, and political orientations shape climate change beliefs and policy preferences (Stanley et al. 2019; Clarke et al. 2019; Milfont and Sibley 2016). Ideological and identity-based divides may be further amplified by citizens' degree of education, political interest, and science literacy (Carrus, Panno, and Leone 2018; Drummond and Fischhoff 2017).

However, the increasing severity of climate anomalies and natural disasters highlights the importance of persuading Americans to adopt environmentally friendly attitudes. Extreme weather

and natural disasters influence citizens' perceptions of climate change, preferences for environmental policies, and evaluations about the competence of elites to protect the life and property of civilians (Zaval et al. 2014; Boudet et al. 2019; Egan and Mullin 2012; Fair et al. 2017; Romero-Canyas et al. 2018; cf. Lyons, Hasell, and Stroud 2018). Evidence for the local warming effect, that is the impact of perceived daily temperatures on global warming beliefs, shows that public opinion on climate change may not be as rational as climate experts and scientists would hope but is still malleable. In the U.S., more than 5,400 people died because of weather or climate disasters that cost over \$850 billion during the last decade. In 2020 alone, 16 natural disasters occurred causing 188 deaths and damages of roughly \$47 billion (A. B. Smith 2020). Hence, it becomes apparent that natural disasters represent an opportunity to inform citizens about climate change and frame the issue in a manner that can affect attitudes toward environmental policies.

Which frames of climate change are most successful in the wake of a natural disaster? I argue that citizens update their opinions about environmental policies as a function of their exposure to new information about climate change as well as to how this information is framed. More specifically, information about climate change should increase public support for environmental policies but the persuasiveness of information should depend on whether its framing resonates or, at least, does not conflict with the salient identities and ideological considerations of the target audience.

To study the effect of different frames on preferences for environmental policies, I leverage the occurrence of Hurricane Laura during the 2020 Atlantic hurricane season. Hurricane Laura was a Category 4 hurricane that lasted ten days, between August 20 and 29, 2020. It is the strongest hurricane to ever hit Louisiana and the flooding rain and storm surge affected the population and economic activity in vast areas of the southwestern and southeastern U.S. Before weakening,

Hurricane Laura caused the death of 77 people and a total damage of approximately \$16 billion. Notwithstanding the devastation it wrought, this event offered an ideal opportunity to study public opinion on climate change during a period of heightened threat from natural disasters.

In this context, I conducted a survey experiment with a nationally diverse sample of American citizens. The experimental design allows to test the persuasiveness of different frames of climate change on preferences for climate change policies and relief measures for natural disasters. Indeed, subjects were randomly assigned to watch a clip about Hurricane Laura and read an op-ed framing climate change as a conservative Christian issue, as a racial justice issue, or merely presenting scientific predictions and technical facts. Although framing climate change as a scientific issue is perhaps the most common strategy in climate change communication, the other two frames are more novel and appeal to distinctive ideological considerations. Randomizing exposure to ideological and non-ideological frames allows to test which communication strategies are most effective in moving public preferences for long-term environmental policies and short-term relief measures.

I find that the magnitude and significance of attitude change depends on the manner climate change is framed. Citizens become more concerned about global warming<sup>1</sup> and support environmental policies and relief measures only when climate change is framed as a conservative, Christian issue or when they are exposed to scientific facts. In contrast, framing climate change as

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<sup>1</sup> I use the terms “climate change” and “global warming” interchangeably throughout the chapter. However, there is evidence that people are more likely to recognize the term “global warming” than “climate change” and respond differently depending on how the phenomenon is described (Schuldt, Konrath, and Schwarz 2011; Motta et al. 2019).

a racial justice issue fails at motivating people to adopt environmentally friendly attitudes. In all three experimental conditions and across 195 model specifications, attitude change occurs in parallel regardless of the degree of education, political awareness, party identity, ideology, and trait authoritarianism. Importantly, I find no evidence for a backlash effect. Together, these findings suggest that citizens behave as “cautious” rather than perfect Bayesians. Framing climate change in ways that resonate with liberals and Democrats may be counter-productive as these subgroups are already favorable toward environmental protection. Instead, frames that are ideologically congruent with or, at least, not threatening to conservative values fare better in terms of persuading citizens to adopt green attitudes.

## **FRAMES AND FRAMING EFFECTS**

The study of framing effects has attracted the attention of such diverse scholars as Berelson, Lazarsfeld, and McPhee, Goffman, and Tversky and Kahneman. The principal thesis of framing theories is that minor changes in the way an issue or event is presented can generate remarkable changes in expressed preferences (Chong and Druckman 2007). Elites employ “frames in communication” to highlight or downplay certain aspects of a policy issue and offer interpretations that influence how citizens think about it. However, their leeway is not unlimited. When individuals evaluate an issue or event, they take into account the implications it has for a variety of beliefs, values, and identity concerns previously stored in their memory. This set of considerations defines their “frame of thought.” To be persuasive, frames in communication proposed by political and media elites should attract citizens’ attention and resonate with idea-elements that constitute their frames of thought.

Frames emerge as the product of a systematic process in political communication (Lasswell 1948). Communication is a dynamic process that unfolds through formal and informal interactions. De Vreese (2005) identifies two steps in this process. First, frame-building takes place principally in newsrooms where journalists organize the order (agenda-setting) and interpretation (framing) of news events. During this phase, journalists do not enjoy complete freedom as they need to take into consideration internal factors (editorial policies or codes of ethic, see de Vreese, Semetko, and Jochen (2001)) and external pressures (from political elites or the audience, see Entman (2003a)). The final product of this step is a series of media frames. The second step is frame-setting. Frame-setting describes the interaction between exposure to media frames and individual predispositions. The aim of frame-setting is to affect citizens' ability to process information and their propensity to update their opinions and take action.

There are two types of framing effects. First, equivalency or valence framing effects occur when "different, but logically equivalent, phrases cause individuals to alter their preferences" (Chong and Druckman 2007). Perhaps the most paradigmatic case of equivalency framing effects is Tversky and Kahneman's "Asian disease problem" (1986). In this problem, subjects exposed to a survival frame are less willing to take a risk than when exposed to a mortality frame. Likewise, Pedersen (2017) demonstrates that framing ratios in a different but logically equivalent manner produces substantial discrepancies in citizens' policy preferences about taxes and education.

Second, issue or emphasis framing effects suggest that public attitudes can be affected by increasing the salience of certain potentially relevant considerations regarding an issue or event (Druckman 2001b; Nelson 2011). Frames for this type of framing effects emphasize qualitatively different facets of an issue rather than offering logically identical representations of the same information. A classic example of emphasis framing effects comes from Nelson, Clawson, and



Oxley (1997) who show that public tolerance for Ku Klux Klan depends on whether their rallies are framed as a free speech issue or as a threat to public order. Although in the early phases of the emergence of an issue on the public agenda different frames may compete by emphasizing distinctive subsets of considerations, the repetition of a particular frame can result in establishing a hegemonic way of thinking about an issue that is difficult to counterframe (Entman 2003b; Chong and Druckman 2013).

The presence of framing effects calls into question the competence of citizens to deal rationally with politics. Framing theory challenges the view that citizens are rational agents who hold preferences that follow the basic rules of invariance, transitivity, dominance, and cancellation as described in utility theory (Kahneman and Tversky 1979; Tversky and Kahneman 1986). Instead, individuals are thought to express cursory opinions that display little consistency across time and issue domains (Converse 1964; Coppock and Green 2021). Because of the loose structure that mass belief systems exhibit, framing policy issues represents a delicate endeavor in terms of persuasion.

A strand of the literature advocates that framing effects are ubiquitous and strong enough to manipulate citizens' judgements (Page and Shapiro 1992, 366–367; Zaller 1992, 13-16, 24-25; Entman 1993, 57). The main argument of these accounts is that individuals do not change their views on the basis of raw facts and accurate depictions of reality. Rather, they consume interpretations of facts and imperfectly adopt them to attribute meaning to an otherwise complicated world. Given that elites have a strategic incentive to undermine citizens' rationality (Downs 1957), it is easy to understand why the normative repercussions of framing effects for democratic theory are more than substantial.

However, this view has been contested by proponents of the “minimal effects” thesis (Klapper 1960; Krosnick and Macinnis 2015; Chong and Druckman 2007). In sum, this line of research argues that when they occur, framing effects are small. Their magnitude depends on three factors. First is the repetition and strength of the frame. The more often individuals are exposed to a frame and the stronger it resonates with them, the more persuasive it is. Second, contextual factors play an important role. For a frame to be effective, citizens should perceive the source of the message as credible (Druckman 2001a). Further, in competitive information environments framing effects of opposite frames counteract and decay through time (Chong and Druckman 2013). Finally, individual predispositions, such as political orientation and awareness, moderate the impact of frames in communication. Frames that are not relevant or congruent with citizens’ motivations may be resisted or outwardly rejected. In line with this research, I expect that framing effects on environmental attitudes will be positive but small ( $H_1$ ).

## **FRAMING CLIMATE CHANGE AFTER NATURAL DISASTERS**

Scholars have extensively tested the effectiveness of different frames in communicating climate-related risk. Some scholars suggest that framing climate change as air pollution is an effective way to change minds (Hart and Feldman 2018). Others argue that describing the environmental crisis as “climate change” rather than “global warming” can persuade conservatives and Republicans, who are generally more reluctant to support environmental action (Schuldt, Konrath, and Schwarz 2011; cf. Soutter and Möttus 2020).

Several studies have focused on the role of responsibility attribution and emotions in mobilizing the public. Bolsen, Druckman, and Cook (2014) find that framing climate change as an

individual responsibility combined with highlighting the collective benefits from environmental preservation increases environmental collective action. Conversely, attributing the responsibility for tackling climate change to the government demobilizes people.

As natural disasters increase in intensity and frequency because of climate change, the attribution of responsibility has become a salient issue in their aftermath (Aalst 2006). Despite findings showing that citizens make relatively principled judgments when they learn about officials' responsibilities, partisan cues and emotions have a decisive effect on blame attribution after natural disasters (Malhotra and Kuo 2008; 2009). Natural disasters increase public engagement in climate change mitigation (Fair et al. 2017; Boudet et al. 2019) but voters seem to discount the utility of long-term environmental policies and reward politicians only for disaster relief policies that have a short-term impact (Healy and Malhotra 2009).

Other studies investigate the impact of social norms and institutions on collective action toward climate change. Findings from field experiments demonstrate that increasing peer pressure and social comparison can reduce energy consumption substantially (Allcott 2011; Ayres, Raseman, and Shih 2009). Although Americans support the funding of national rather than international programs against global warming (Buntaine and Prather 2018), institutions and policy designs are important determinants of supporting environmental action at the international level. In general, democracies are better equipped to contain the negative economic consequences of global warming than authoritarian regimes due to the accountability mechanisms they employ (Smirnov et al. 2018). However, international cooperation on climate change can be reinforced by establishing reciprocal relations (Tingley and Tomz 2014) and adopting fair, inclusive, and reward-oriented policies (Bechtel and Scheve 2013).

Because climate change is a highly polarized issue in the U.S. (E. K. Smith and Mayer 2018; Hornsey et al. 2016; Tesler 2018), a rich literature focuses on climate change frames that draw on ideology and moral values to sway public opinion. Luong, Garrett, and Slater (2019) show that public support for fracking and renewable energy depends on whether these issues are framed in liberal or conservative terms. Their survey experiment provides evidence that individuals exhibit motivated reasoning by increasing their support for either policy when it is presented in a manner congruent with their ideology. Further, both liberals and conservatives decrease their trust in science when exposed to scientific evidence that contradicts their ideological positions (Nisbet, Cooper, and Garrett 2015; also Motta 2018). These findings raise concerns as the media often employ ideological frames in their news stories about climate change (Stecula and Merkley 2019). Similarly, many scholars underscore the importance of tailoring climate change messages to appeal to the different moral foundations of liberal and conservative audiences (Feinberg and Willer 2013; Albertson and Busby 2015; Wolsko, Ariceaga, and Seiden 2016; cf. Crawford 2017).

Another driving force of political polarization on climate change is social identity (Ehret, Van Boven, and Sherman 2018; Mullinix 2016; Johnson and Schwadel 2019; McCright and Dunlap 2011; Karol 2019). White Christians, and especially Evangelicals, are a group that is particularly skeptical about climate change (M. C. Nisbet 2009; Jenkins, Berry, and Kreider 2018). Goldberg et al. (2019; cf. McCright et al. 2016) propose a social identity approach to appeal to religious skeptics of climate change. They find that framing environmental stewardship as compatible with Christian values increases global warming beliefs and support for environmental protection. Nevertheless, the effect of party identity on preferences for green policies dwarfs that of most other identities (Hornsey et al. 2016). Partisan polarization undermines the effect of scientific consensus about human-induced climate change and leads Republicans to reject beliefs

about global warming and policies to tackle it (Bolsen and Druckman 2018). Republicans can still become more favorable toward environmental policies when they are exposed to cues of elite co-partisans who accept the scientific consensus on anthropogenic global warming (Benegal and Scruggs 2018).

Although the politicization of climate change has eroded Americans' trust in climate scientists and experts, frames that underscore the scientific consensus on climate change can increase support for green attitudes. Interest in science is cultivated during early adolescence and has an enduring impact on trust in climate scientists throughout the lifespan (Motta 2018a). However, citizens' trust in climate scientists can be affected by a multitude of factors such as receiving information about the scientific consensus on climate change (Goldberg, Linden, Ballew, et al. 2019) and media diets (Krosnick and Macinnis 2015). Van der Linden et al. (2015) show that bolstering public perceptions of the scientific consensus on anthropogenic global warming increases beliefs that climate change is happening because of human activity and is posing a serious threat to humanity. These changes in beliefs, in turn, predict higher public support for environmental policies. Ironically, trust in scientists' statements can lead people to trust not only scientists who advocate that global warming is real but also experts who are climate skeptics (Macinnis and Krosnick 2016).

## **FRAMING AND ATTITUDE CHANGE**

To study the impact of different framing strategies on attitudes toward climate change, I draw on three theories of public opinion. More specifically, I test the conflicting hypotheses deriving from the Bayesian Learning Model, Zaller's Receive-Accept-Sample (RAS) model, and

motivated reasoning. Although these theoretical streams present a partial overlapping, they offer divergent expectations about the persuasiveness of climate change messages. Importantly, they provide different insights into which subgroups of the public will update their opinion and in which direction.

The fundamental disagreement of these theories is on what motivates citizens to change their views. On the one hand, motivated reasoning contends that individuals are directionally motivated to process information with the goal of arriving at a conclusion that confirms their preexisting beliefs (Kunda 1987; 1990). The RAS model makes a similar argument that underscores the role of political awareness. On the other hand, the Bayesian Learning Model predicts that citizens are motivated by accuracy goals and update their opinions in a sensible manner when presented with messages from credible sources. Testing the validity of these claims is difficult because of observational equivalence: people tend to find credible the very sources with whom they share common values and beliefs (Druckman and McGrath 2019). To efficiently summarize the competing expectations, I develop one set of hypotheses emerging from the RAS model and motivated reasoning and a second set that derives from the Bayesian Learning Model.

To a large extent, Zaller's RAS model and theories of motivated reasoning provide similar predictions about attitude change. The RAS model (1992) proposes that attitude change depends on citizens' degree of political awareness, predispositions, and the structure of communication flows. Citizens who exhibit medium levels of political awareness are most likely to encounter political messages and persuaded by them because they are attentive enough to politics but their views are not politically rigid. In contrast, people characterized by low or high political awareness are less likely to be exposed to political information and more likely to be opinionated, respectively. Indeed, there is abundant evidence that people who score high in different measures

of scientific knowledge and political interest tend to express more polarized opinions (Kahan et al. 2012; Drummond and Fischhoff 2017; Carrus, Panno, and Leone 2018). However, operationalizations of closely related concepts, like science curiosity, yield opposite results (Kahan et al. 2017). Similarly, engaging in discussions about climate change reduces, instead of exacerbates, the polarization of environmental beliefs and policy preferences (Goldberg, Linden, Maibach, et al. 2019).

Motivated reasoning is perhaps the dominant paradigm in explaining public opinion on climate change (Newman, Nisbet, and Nisbet 2018; Luong, Garrett, and Slater 2019; Mullinix 2016; Van Boven, Ehret, and Sherman 2018; Ehret, Van Boven, and Sherman 2018; Guilbeault, Becker, and Centola 2018). Motivated reasoning comprises a variety of theories that emphasize the importance of political predispositions (Wong-Parodi and Feygina 2020). These theories highlight the role of system justification (Feygina, Jost, and Goldsmith 2010), social and political identities (Taber and Lodge 2006), and worldviews (Kahan, Jenkins-Smith, and Braman 2011) in shaping directional motivation. The most prominent theory of motivated reasoning regarding climate change is Kahan's cultural cognition, which posits that what citizens believe about climate change reflects who they are rather than their knowledge about the issue (Kahan 2015; 2017; for a conceptual critique, see van der Linden 2016). Although motivated reasoning is often portrayed as an unbreakable curse of citizens' bounded rationality, there is evidence that social and political norms can moderate the effect of directional motivation on attitude change (Goldberg, van der Linden, et al. 2019; Saunders 2017).

Motivated reasoning manifests itself in three forms (Lodge and Taber 2013). First is a confirmation bias, where motivated individuals search for information that confirms their prior beliefs. Second, individuals assimilate information in a biased manner by placing greater weight

on information that is congruent with their priors and little weight on messages that contradict their predispositions. Third, citizens can show disconfirmation bias, when they devote more time and effort to counter-argue information contrary to their preexisting beliefs. In extreme cases, disconfirmation bias can result in boomerang effects, where individuals change their views in the opposite direction of the information they receive (Byrne and Hart 2009; Hart and Nisbet 2012).

Overall, motivated reasoning and the RAS model provide four predictions about the effectiveness of the framing strategies studied in this chapter. First, framing climate protection as a conservative, Christian value should increase environmental concerns and support for green policies and disaster relief measures only among conservatives, Republicans, and authoritarians ( $H_{2a}$ ). Second, frames that present climate change as an issue of racial justice should lead only liberals, Democrats, and less authoritarian individuals to adopt environmentally friendly attitudes ( $H_{2b}$ ). Third, exposure to scientific facts about anthropogenic climate change should sway the opinions of liberals more than those of conservatives, because the scientific consensus is politically congruent with the environmental agenda of Democrats and contradicts the ideological positions of Republicans and authoritarians ( $H_{2c}$ ). Finally, these effects should be stronger depending on the degree of political awareness that citizens display ( $H_{2d}$ ).

A theoretical framework that has gained traction in recent years is the Bayesian Learning Model. This model stipulates that individuals update their opinions by conditioning their prior beliefs on the perceived distance between their priors and new evidence (Druckman and McGrath 2019). Although the Bayesian model can accommodate different predictions of opinion change, it posits that individuals are motivated to form accurate opinions and to change them in a reasonable manner. Indeed, Hill (2017) demonstrates that citizens update their opinions as cautious Bayesians. When presented with politically congruent information, their learning is indistinguishable from



perfect Bayesian. However, information that contradicts their prior beliefs can incite limited directional bias. In line with these findings, Ripberger et al. (2017) provides evidence that individuals draw on fluctuations in the natural system to inform their perceptions of climate anomalies without exhibiting political bias.

This conceptualization of opinion formation is consistent with the depiction of the American public as a collectivity that expresses more or less stable positions over time and changes them in light of new information (Page and Shapiro 1992). Indeed, Page and Shapiro (1992, 149-156) show that public preferences for environmental policies trend in parallel between 1966 and 1990, independent of citizens' demographic and political characteristics. Egan and Mullin (2017, 218) report similar trends from 1989 to 2017, when climate change became a polarized issue. At the individual level, the parallel publics thesis is compatible with two hypotheses. More specifically, citizens should update their attitudes in the direction of evidence irrespective of the framing strategy ( $H_{3a}$ ) and their background characteristics ( $H_{3b}$ ).

## **SUMMARY OF THE ARGUMENT**

I argue that citizens update their attitudes toward long-term environmental policies and short-term disaster relief measures in an understandable way as a function of their exposure to new information about climate change and whether this information is framed in ideological and non-ideological terms. More specifically, information about climate change should increase public demands for environmental policies but the persuasiveness of information should be greater if its framing is ideologically congruent or, at least, does not conflict with the salient political considerations of the target audience.

## RESEARCH DESIGN AND METHODS

To test my argument, I carried out a survey experiment during the Atlantic hurricane season and a month after Hurricane Laura occurred. The 2020 hurricane season was the most active and one of the costliest Atlantic hurricane seasons on record. This context increased the external validity of my experimental design as climate anomalies and global warming received considerable attention due to the destructive hurricanes in the Atlantic coastal region and the devastating wildfires in California.

The study was conducted with a nationally diverse sample of American citizens ( $N = 2,478$ ) by Lucid from September 17 to October 7, 2020.<sup>2</sup> The experiment has four experimental arms, a placebo and three treatment groups. A total of 1044 subjects were randomly assigned to the placebo group to reduce the uncertainty that surrounds the causal estimates. Treatment groups 1, 2, and 3 include 468, 492, and 476 subjects, respectively.

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<sup>2</sup> Lucid is the largest marketplace for online samples in the US. Lucid employs quota sampling and a matching algorithm to produce an Internet sample that closely approximates the demographic characteristics of the general population of the United States as described in the most current national census. Coppock and McClellan (2019) find that samples on Lucid resemble representative probability samples closer than their counterparts on MTurk in almost every observable attribute. The experimental study had a completion rate of 43.28%. and lasted for approximately 15 minutes. This research was reviewed and approved by the Institutional Review Board of Columbia University (IRB-AAAT0842).

## ***Procedure***

Subjects were randomly allocated to one of four groups after completing a short questionnaire to gather baseline information. All treatments comprised a news article of roughly 800 words and a 2-minute clip. Subjects were invited to fill out a survey after receiving the treatment in order to measure the outcomes of the intervention.

In treatment group 1, subjects read an op-ed that framed environmental protection as a conservative and Christian value. The main argument of the author was that there is nothing contradictory about being a conservative Christian and caring about climate change. Subjects in the second treatment group read a different op-ed that presented climate change as a racial justice issue. The article highlighted that climate anomalies affect racial minorities disproportionately because of the systemic racism in housing and healthcare. In the last treatment group, subjects read an op-ed that provided scientific facts about the environmental crisis without any reference to politics. In specific, the article referred to the new scientific predictions about climate sensitivity and urged taking immediate action to combat climate change.<sup>3</sup> After reading the op-eds, subjects in all three treatment groups watched a short news story about Hurricane Laura and the devastation it caused in Louisiana and Texas. Finally, subjects in the placebo group read an article about the

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<sup>3</sup> All op-eds were originally published in *The New York Times* except for the op-ed that was used in treatment group 3, which appeared in *Vox*. The op-eds were slightly edited to reduce their length and all cues about their original source were removed. The full wording of the treatments is available in Appendix D.

cultural history of oak trees and watched a news story about families participating in apple-picking activities in New York.<sup>4</sup>

### *Analytic Strategy*

The estimands of interest are the Average Treatment Effect (ATE) and the Conditional Average Treatment Effect (CATE). The ATE represents the average difference between treated and untreated outcomes and is estimated separately for each pair of outcomes to avoid problems with multiple comparisons. Difference-in-means estimators are bivariate OLS regressions. To compute covariate-adjusted estimates, I include controls for pre-treatment covariates. In fact, the latter estimates are more reliable because the balance test hints that the experimental design is not perfectly balanced (see Tables A1 and A2 in Appendix). When necessary, heteroskedasticity-consistent (HC1) standard errors are estimated.

To search for heterogeneous treatment effects, I estimate the Conditional Average Treatment Effect, that is the ATE for different subgroups. The CATE is obtained by including a treatment-by-covariate interaction in the linear multivariate models to capture the conditional effects of education, political awareness, ideology, partisan identity, and trait authoritarianism, separately. The coefficients of these interactions should not be interpreted causally. Instead, they

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<sup>4</sup> The placebo condition provides a strict test of the hypotheses because it comprises treatments that refer broadly to nature. However, a direct link between apple-picking season, the historical importance of oak trees and environmentalism remains arguably elusive.

show whether the ATE varies across the levels of the pre-treatment variable. Finally, I estimate a total of 195 F-tests to compare the multivariate models to the conditional models.

### ***Measures***

Prior to treatment assignment, subjects completed a short questionnaire about their demographic characteristics, political interest, ideology, partisan identity, and trait authoritarianism. To tap into political awareness I create a composite scale of education and political interest (Zaller 1992). Accordingly, I operationalize trait authoritarianism by adding four items measuring child-rearing values (Pérez and Hetherington 2014). The post-treatment survey measured attitudes toward climate change and natural disasters as well as preferences for environmental policies and disaster relief measures. The outcomes were measured with a 7-point scale and all variables were normalized to range from 0 to 1.

I tapped into attitudes toward global warming and natural disasters with two measures. The first item asked subjects how serious of a problem they think global warming will be for the world if nothing is done to reduce it. The second question was about how concerned they are about deaths increasing during the hurricane season. Further, subjects were presented with two trade-offs. The first trade-off asked whether, under budget constraints, the government should prioritize providing federal relief to citizens hit by natural disasters or investing in long-term environmental policies. The second item asked whether the government should or should not limit the amount of greenhouse gasses that U.S. businesses put out, even if this measure hurts them, in order to reduce the chance of a future natural disaster.

Subjects were also asked about their preferences for environmental policies with three items, namely, whether they favor or oppose giving companies tax breaks to produce more electricity from renewable resources, requiring companies to pay a tax on the pollution they emit, and funding more research into renewable energy sources. Similarly, subjects answered three questions about their preferences for disaster relief measures. These measures included offering financial assistance, free housing, and free healthcare to victims of natural disasters.<sup>5</sup>

Finally, I conducted principal axis factoring with *promax* rotation to explore the factors that underlie preferences for environmental policies and disaster relief measures. The results suggest that the items load on two factors (see Table A3 in Appendix). Accordingly, I construct an additive scale for public attitudes toward long-term environmental policies (*Cronbach's alpha* = 0.900), and a second scale that measures attitudes toward disaster relief measures (*Cronbach's alpha* = 0.805). I also create a scale that measures the general demand of the public for environmental policies and sums up preferences for both long-term policies and short-term relief measures (*Cronbach's alpha* = 0.885).

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<sup>5</sup> Apart from original items, the survey included questions developed by the Political Psychology Research Group at Stanford University in their research on the American Public Opinion on Global Warming and scholars at the Yale Program on Climate Change Communication. At the end of the survey, I measured public support for a series of policies that are irrelevant to climate change and natural disasters. These items included policy preferences for same-sex marriage, abortion rights, gun control, death penalty, increasing taxes for the rich, and implementing a universal healthcare program. The analysis of downstream effects is found in Appendix C.

## EMPIRICAL RESULTS

I organize the analysis of each framing strategy in separate sections. First, I present the effects of the conservative, Christian frame of climate change on environmental concerns, attitudes, and policy preferences. I then turn my focus to the impact of the racial justice frame and presenting scientific predictions about climate change. The analysis demonstrates that framing climate change as a conservative, Christian value and exposure to scientific facts can reinforce environmental attitudes. In contrast, framing climate change as a racial justice issue has almost no impact on public support for environmental protection.

Overall, the results show that framing effects, when they occur, are positive and rather small substantively, ranging from 2.8 to 6.8 percentage points. Nevertheless, these effect sizes are still considerable given that, on average, untreated subjects hold strong environmental beliefs, as indicated by the intercepts of the difference-in-means models. In other words, the small absolute values of the causal effects in reality mask noteworthy changes in opinions.

Finally, I explore the heterogeneous effects of treatments across degrees of education, political awareness, ideology, partisan affiliation, and trait authoritarianism. In general, I find little evidence that heterogeneous effects occur. The only exception is partisan identity which, in several cases, moderates the effect of presenting scientific facts about climate change. However, contrary to expectations from motivated reasoning, these heterogeneous effects suggest that it is mostly Republicans who are persuaded by scientific facts. Attitude change among Democrats seems to be subject to a ceiling effect due to the fact that Democrats overwhelmingly agree with environmentalism and climate science (see Tables C7-C8 in Appendix).

For presentation purposes, I organize all tables in three parts. The first row in each part shows the estimate of the average treatment effect of each treatment on outcomes. The second reports standard errors estimated from OLS regressions, corrected for heteroskedasticity when necessary. The third row presents two-tailed  $p$ -values. The fourth and fifth rows report the intercept and the respective standard errors. The following row mentions whether the model includes controls for pretreatment covariates. The size of the sample is indicated in the last row.

### ***Framing Climate Change as a Conservative Christian Issue***

In this section, I focus on the effects of the conservative Christian frame of climate change on environmental attitudes. The results are presented in the first part of Tables 1-4. Table 1 shows that exposure to the treatment increases the belief that global warming will be a serious problem for the world unless people act on it by 3.8 percentage points ( $p = 0.008$ ). Similarly, public concerns that deaths will increase during the hurricane season are raised by 5.6 p.p. ( $p < 0.001$ ).

But are these concerns translated into changes in preferences for environmental policies and disaster relief measures? The findings support an affirmative answer. Indeed, Table 2 reports that there is a 3.1 percentage point increase in public demands for environmental policies ( $p = 0.005$ ). Further, the conservative Christian frame leads individuals to become more willing to back measures that will reduce climate change and the chance of a future natural disaster, even at the expense of U.S. businesses ( $\widehat{ATE} = 0.049$ ,  $p = 0.020$ ). However, there is no impact on whether citizens prioritize long-term environmental policies over disaster relief measures ( $\widehat{ATE} = 0.022$ ,  $p = 0.478$ ).



Table 3.1 The direct effects of treatments on environmental concerns

	Environmental Concerns			
	Global warming is a serious problem		Concerned that hurricane-related deaths will increase	
	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Conservative Christian Framing</i>				
ATE	0.033	0.038	0.045	0.056
(SE)	(0.015)	(0.014)	(0.016)	(0.015)
<i>p-value</i>	0.032	0.008	0.004	<0.001
<u>Intercept</u>	0.773	0.853	0.675	0.611
(SE)	(0.009)	(0.040)	(0.009)	(0.042)
Covariates	No	Yes	No	Yes
N	1404	1222	1400	1225
<i>Treatment Group 2 : Racial Justice Framing</i>				
ATE	0.008	0.005	0.044	0.039
(SE)	(0.016)	(0.015)	(0.015)	(0.015)
<i>p-value</i>	0.521	0.720	0.005	0.012
<u>Intercept</u>	0.773	0.884	0.675	0.636
(SE)	(0.009)	(0.040)	(0.009)	(0.042)
Covariates	No	Yes	No	Yes
N	1429	1263	1422	1260
<i>Treatment Group 3 : Scientific Research Framing</i>				
ATE	0.042	0.045	0.062	0.068
(SE)	(0.014)	(0.013)	(0.015)	(0.015)
<i>p-value</i>	0.004	<0.001	<0.001	<0.001
<u>Intercept</u>	0.773	0.825	0.675	0.594
(SE)	(0.009)	(0.040)	(0.009)	(0.040)
Covariates	No	Yes	No	Yes
N	1425	1250	1406	1260

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 3.2 The direct effects of treatments on environmental attitudes

	Environmental Attitudes					
	Economy vs. Environment		Long-term vs. Short-term Policies		Environmental Policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Conservative Christian Framing</i>						
ATE	0.027	0.049	0.001	0.022	0.021	0.031
(SE)	(0.022)	(0.021)	(0.030)	(0.031)	(0.012)	(0.011)
<i>p-value</i>	0.214	0.020	0.981	0.478	0.087	0.005
Intercept	0.820	0.974	0.446	0.614	0.778	0.805
(SE)	(0.013)	(0.060)	(0.016)	(0.081)	(0.007)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes
N	1241	1101	1266	1123	1271	1123
<i>Treatment Group 2 : Racial Justice Framing</i>						
ATE	-0.011	-0.012	-0.017	-0.008	0.003	0.004
(SE)	(0.023)	(0.022)	(0.029)	(0.030)	(0.012)	(0.011)
<i>p-value</i>	0.623	0.590	0.548	0.786	0.753	0.709
Intercept	0.820	1.033	0.446	0.576	0.778	0.820
(SE)	(0.013)	(0.060)	(0.016)	(0.080)	(0.007)	(0.035)
Covariates	No	Yes	No	Yes	No	Yes
N	1271	1139	1299	1161	1285	1154
<i>Treatment Group 3 : Scientific Research Framing</i>						
ATE	0.041	0.044	0.055	0.062	0.024	0.028
(SE)	(0.021)	(0.021)	(0.029)	(0.031)	(0.012)	(0.011)
<i>p-value</i>	0.056	0.037	0.063	0.045	0.045	0.013
Intercept	0.820	0.995	0.446	0.495	0.778	0.794
(SE)	(0.013)	(0.060)	(0.016)	(0.081)	(0.007)	(0.032)
Covariates	No	Yes	No	Yes	No	Yes
N	1257	1127	1279	1140	1279	1144

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 3.3 The direct effects of treatments on preferences for long-term environmental policies

	Long-term Environmental Policies							
	Tax breaks to companies		Pollution tax to companies		Fund more green research		Long-term Environmental Policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Conservative Christian Framing</i>								
ATE	0.018	0.037	0.013	0.017	0.018	0.029	0.018	0.028
(SE)	(0.015)	(0.014)	(0.016)	(0.015)	(0.014)	(0.013)	(0.013)	(0.012)
<i>p-value</i>	<i>0.221</i>	<i>0.010</i>	<i>0.413</i>	<i>0.269</i>	<i>0.208</i>	<i>0.031</i>	<i>0.157</i>	<i>0.017</i>
Intercept	0.745	0.691	0.774	0.848	0.798	0.879	0.775	0.796
(SE)	(0.008)	(0.042)	(0.009)	(0.042)	(0.008)	(0.039)	(0.007)	(0.033)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1389	1223	1398	1225	1428	1242	1325	1174
<i>Treatment Group 2 : Racial Justice Framing</i>								
ATE	-0.002	-0.010	0.002	-0.005	-0.009	-0.020	-0.005	-0.014
(SE)	(0.015)	(0.015)	(0.016)	(0.015)	(0.014)	(0.014)	(0.013)	(0.012)
<i>p-value</i>	<i>0.874</i>	<i>0.500</i>	<i>0.865</i>	<i>0.724</i>	<i>0.525</i>	<i>0.157</i>	<i>0.661</i>	<i>0.267</i>
Intercept	0.745	0.724	0.774	0.879	0.798	0.887	0.775	0.825
(SE)	(0.008)	(0.042)	(0.009)	(0.042)	(0.008)	(0.037)	(0.007)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1399	1255	1421	1261	1445	1277	1344	1209
<i>Treatment Group 3 : Scientific Research Framing</i>								
ATE	0.026	0.021	0.020	0.018	0.019	0.022	0.023	0.021
(SE)	(0.015)	(0.014)	(0.015)	(0.015)	(0.014)	(0.013)	(0.012)	(0.012)
<i>p-value</i>	<i>0.076</i>	<i>0.148</i>	<i>0.174</i>	<i>0.209</i>	<i>0.184</i>	<i>0.111</i>	<i>0.066</i>	<i>0.079</i>
Intercept	0.745	0.714	0.774	0.823	0.798	0.853	0.775	0.803
(SE)	(0.008)	(0.041)	(0.009)	(0.042)	(0.008)	(0.036)	(0.007)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1392	1238	1408	1244	1440	1262	1335	1195

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p-values* are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 3.4 The direct effects of treatments on preferences for short-term disaster relief measures

	Short-term Disaster Relief Measures							
	Financial relief to victims		Free housing to victims		Free healthcare to victims		Short-term Environmental Policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Conservative Christian Framing</i>								
ATE	0.022	0.031	0.022	0.034	0.007	0.020	0.017	0.029
(SE)	(0.013)	(0.013)	(0.014)	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)
<i>p-value</i>	<i>0.091</i>	<i>0.015</i>	<i>0.114</i>	<i>0.022</i>	<i>0.621</i>	<i>0.174</i>	<i>0.178</i>	<i>0.029</i>
Intercept	0.803	0.834	0.771	0.835	0.772	0.836	0.786	0.834
(SE)	(0.007)	(0.033)	(0.008)	(0.038)	(0.008)	(0.038)	(0.007)	(0.033)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1433	1247	1412	1229	1414	1232	1370	1195
<i>Treatment Group 2 : Racial Justice Framing</i>								
ATE	0.018	0.018	0.004	0.010	0.008	0.015	0.008	0.014
(SE)	(0.012)	(0.012)	(0.014)	(0.014)	(0.015)	(0.014)	(0.013)	(0.012)
<i>p-value</i>	<i>0.140</i>	<i>0.138</i>	<i>0.732</i>	<i>0.491</i>	<i>0.556</i>	<i>0.282</i>	<i>0.515</i>	<i>0.268</i>
Intercept	0.803	0.805	0.771	0.846	0.772	0.282	0.786	0.843
(SE)	(0.007)	(0.033)	(0.008)	(0.039)	(0.008)	(0.038)	(0.007)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1454	1289	1430	1269	1426	1263	1389	1232
<i>Treatment Group 3 : Scientific Research Framing</i>								
ATE	0.017	0.020	0.013	0.027	0.018	0.031	0.018	0.030
(SE)	(0.012)	(0.013)	(0.014)	(0.014)	(0.014)	(0.014)	(0.012)	(0.012)
<i>p-value</i>	<i>0.176</i>	<i>0.113</i>	<i>0.341</i>	<i>0.061</i>	<i>0.209</i>	<i>0.031</i>	<i>0.143</i>	<i>0.016</i>
Intercept	0.803	0.804	0.771	0.800	0.772	0.832	0.786	0.811
(SE)	(0.007)	(0.033)	(0.008)	(0.039)	(0.008)	(0.038)	(0.007)	(0.033)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1439	1267	1418	1250	1411	1243	1374	1213

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 3 presents the results for the framing effect on preferences for long-term investments in environmental protection. In general, the treatment increases preferences for environmental policies ( $\widehat{ATE} = 0.028$ ,  $p = 0.017$ ). More specifically, the conservative Christian frame strengthens support for giving tax breaks to companies that are environmentally friendly by 3.7 p.p. ( $p = 0.010$ ) but not for imposing a pollution tax on businesses ( $\widehat{ATE} = 0.017$ ,  $p = 0.269$ ). Moreover, individuals become more supportive of funding research into renewable energy sources by 2.9 p.p. ( $p = 0.031$ ).

In Table 4, I report the treatment effects on preferences for disaster relief measures. Framing climate change as a conservative, Christian issue boosts public support for short-term relief measures by 2.9 p.p. ( $p = 0.029$ ). In particular, individuals express greater approval for measures that help victims of natural disasters by offering financial assistance ( $\widehat{ATE} = 0.031$ ,  $p = 0.015$ ) and free access to housing ( $\widehat{ATE} = 0.034$ ,  $p = 0.022$ ) but not healthcare services ( $\widehat{ATE} = 0.020$ ,  $p = 0.174$ ).

Overall, these results offer initial support for Hypothesis 1, that framing effects are small and positive. Framing climate change in conservative terms leads people to be more concerned about global warming and natural disasters and moves public opinion toward more environmentally friendly attitudes

### ***Framing Climate Change as a Racial Justice Issue***

I now turn my focus to the effects of framing climate change as an issue of racial justice. The results are shown in the second part of Tables 1-4. As can be observed, this frame fails stunningly at persuading individuals to adopt stronger environmental preferences.

With the exception of increasing public concerns about the death toll of the hurricane season ( $\widehat{ATE} = 0.039$ ,  $p = 0.012$ ), the treatment does not have a statistically significant impact on any other outcome. This finding echoes worries about minorities being disproportionately affected by natural disasters in the past, and most notably during Hurricane Katrina. Disturbingly though, individuals do not update their policy preferences according to this perceived threat.

Although these results are compatible with expectations from motivated reasoning and weigh against the hypothesis that citizens update their opinions regardless of the framing strategy ( $H_{3a}$ ), I find no evidence of a boomerang effect. I interpret these results as the product of a dual process. On the one hand, liberals and Democrats do not update their opinions because their support for environmental policies is too high to be further increased. On the other hand, conservatives and Republicans exhibit directional bias and resist the message because they perceive the issues of racial justice and environmentalism as threatening to their political identity.

### ***Framing Climate Change as a Scientific Issue***

This section reports tests for the effect of presenting climate change as a scientific issue on environmental attitudes. Results are presented in the third part of Tables 1-4. Providing individuals with scientific facts about climate change has a positive impact on their environmental beliefs and preferences.

Learning about the new climate change predictions of the scientific community raises worries about global warming and the mortality rate of the hurricane season by 4.5 p.p. ( $p < 0.001$ ) and 6.8 p.p. ( $p < 0.001$ ), respectively. Accordingly, citizens increase their support for environmental policies even if they hurt the economy by 4.4 p.p. ( $p = 0.037$ ) and become less

shortsighted by endorsing long-term policies more than short-term relief measures ( $\widehat{ATE} = 0.062$ ,  $p = 0.045$ ). Similarly, public demands for environmental action are strengthened by 2.8 p.p. ( $p = 0.013$ )

Although there is a marginal increase for long-term environmental policies in general ( $\widehat{ATE} = 0.021$ ,  $p = 0.079$ ), stronger public demands for action are not followed by an increase in preferences for any particular long-term policy (all  $p$ s  $> 0.111$ ). In contrast, the treatment causes individuals to become more supportive of relief measures, such as offering free housing ( $\widehat{ATE} = 0.027$ ,  $p = 0.061$ ) and healthcare ( $\widehat{ATE} = 0.031$ ,  $p = 0.031$ ) to victims of natural disasters. Overall, support for disaster relief measures increases by 3 p.p. ( $p = 0.016$ )

In sum, these findings, together with those from the racial justice frame, suggest that there are limitations to the gateway model of climate change proposed by van der Linden et al. (2015). It seems that, under certain conditions, raising public concerns about the environment is not translated into greater support for environmental policies.

### ***Heterogeneous Effects***

In this section, I focus on the variance of treatment effects across characteristics that are considered to be robust moderators of attitude change toward climate change. More specifically, I study the moderating effects of education, political awareness, ideology, partisan identity, and trait authoritarianism. To investigate heterogeneous effects, I estimate 195 conditional models, five models for each outcome in each treatment arm. The results from the F-tests are reported in Tables B1-B4 in Appendix B. A statistically significant F-value suggests that the conditional model fits the data better than the nested multivariate model.

Partisan identity is one of the most important determinants of environmental attitudes (Hornsey et al. 2016). Indeed, the literature provides consistent evidence for a large partisan gap on views about climate change between Democrats and Republicans (MacInnis and Krosnick 2020b; Leiserowitz et al. 2019). In the same line, many scholarly works find that citizens resist messages about climate change on partisan grounds (Bolsen and Druckman 2018; Guilbeault, Becker, and Centola 2018; Van Boven, Ehret, and Sherman 2018) or even become more hostile toward environmentalism when exposed to them (Hart and Nisbet 2012).

Despite these findings, I find little evidence in favor of theories of motivated reasoning and the RAS model. When exposed to the conservative Christian or racial justice frame of climate change, partisans update (or refrain from updating) their opinion regardless of their party identity. Indeed, none of the 26 F-tests yield significant results. Yet, in the condition where individuals received scientific facts about climate change, 7 out of 13 F-values are significant at the 0.05 level. These conditional effects, however, have the opposite sign from what is expected by motivated reasoning. It is Republicans, not Democrats, who change their views at a higher rate when informed about the scientific facts, thus disconfirming Hypothesis 3c. This occurs because of a ceiling effect among Democrats, who already believe strongly in climate science and its predictions. Therefore, these findings suggest that exposure to scientific evidence encourages attitude convergence rather than polarization.

The remaining moderators perform even worse than partisanship. Regarding ideology and education, out of 39 F-values for each moderating variable only 3 achieve statistical significance. Further, just 2 out of the 39 conditional models that explore the role of trait authoritarianism seem to fit the data better than the respective non-interactive multivariate models. However, the weakest



moderating variable is political awareness that does not condition the treatments at all, contrary to expectations from the RAS model.

Together, these results provide suggestive evidence in favor of the Bayesian Learning Model and the parallel publics thesis as individuals consistently change their opinions in the same direction and in a parallel manner ( $H_{3b}$ ). In contrast, predictions derived from motivated reasoning and the RAS model receive little empirical support ( $H_{2a-d}$ ). Although partisanship moderates the effect of being exposed to scientific facts about climate change in certain cases, the moderation manifests itself in a way that is incompatible with the existence of directional bias. Overall, attitude change seems to occur similarly across subgroups of the population and is driven mostly by accuracy goals.

## CONCLUSION

Climate change represents a challenge to all aspects of human activity. As natural disasters become more severe due to climate anomalies, the cost in human lives and destroyed properties and infrastructure rises. However, the increasing polarization discourages U.S. governments from implementing drastic policies to tackle the causes and consequences of global warming. Persuading citizens on the importance of environmental collective action has proven a difficult exercise for both political elites and climate scientists. Although a variety of communication strategies have been proposed, framing seems to be one of the most promising tools to change minds and promote environmental consciousness.

In this chapter, I argued that citizens update their attitudes toward environmentalism in a reasonable manner as a function of new information about climate change and how this

information is framed. To test this argument empirically, I conducted an experimental survey with a nationally diverse sample after Hurricane Laura during the 2020 Atlantic hurricane season. This timing allows to study changes in public beliefs in a context where climate change is particularly salient because of the frequent natural disasters. The intervention had three experimental arms and tested the framing effects of presenting climate change as a conservative Christian issue, as a racial justice issue, or as an issue of scientific concern.

The results suggest that the persuasiveness of the messages depends on how climate change is framed. More specifically, citizens change their environmental beliefs and policy preferences only when climate change is framed in conservative, Christian or scientific terms. Despite the fact that global warming is regularly presented through the lens of climate science, frames that draw on conservative and Christian values are not employed as often. This study offers evidence that this type of framing is particularly persuasive. Indeed, not only can it lead conservatives to adopt environmentally friendly attitudes because it resonates with their broader beliefs, but also it is novel enough to increase support for green policies across liberals, whose opinions are already saturated with pro-environmental concerns.

In contrast, framing climate change as a racial justice issue is ineffective in swaying public opinion. I attribute this failure to a dual process where different groups update in a similar manner but for different reasons. On the one hand, the opinions of liberals and Democrats are subject to a ceiling effect as they are already favorable toward environmental protection and racial justice. On the other hand, there are two explanations about why conservatives and Republicans resist attitude change. It may be the case that conservatives and Republicans engage in motivated reasoning because the message frames climate change, a controversial issue for them, in a way that threatens their identity and worldviews. Indeed, environmental protection and racial justice belong to the

liberal repertoire of policy issues and partisan animus was intense in the wake of the George Floyd protests when the survey experiment was conducted.

Alternatively, directional bias may not occur but the intervention is not informative enough to move public opinion. However, all op-eds made clear arguments and provided a lot of (albeit not the same) information. Even if the racial justice frame was not novel enough, then this should be more pronounced among Democrats and liberals who regularly consume information about racial and environmental justice. Accordingly, because their media diet does not include much information about these issues, at least not from the perspective of this op-ed, Republicans and conservatives should appreciate the novelty of the message. If this alternative explanation was valid, then Republicans and conservatives would change their attitudes at a higher rate than Democrats and liberals, similar to how they respond when exposed to scientific information about climate change. This is not what the results suggest but future research should adjudicate on which mechanism underlies the resistance of Republicans to update their views.

Nonetheless, when the frames are persuasive they lead individuals to change their opinions in the direction of the evidence and in a parallel manner (Page and Shapiro 1992; Druckman and McGrath 2019). Importantly, there is no evidence of a backlash effect. Although the persuasiveness of climate change messages depends on their ideological slant on average, different subgroups of the population respond similarly to the same messages. In other words, the average treatment effect of climate change messages depends on how these messages are framed, but the treatment effect exhibits minimal variance across the different publics that compose the American citizenry.

Citizens increase their environmental attitudes regardless of their degree of education, political awareness, party identity, ideology, or trait authoritarianism. The only exception is that,

in certain cases, party identity moderates the effect of being exposed to scientific facts about climate change. When exposed to scientific facts, Republicans increase their environmental preferences at a higher rate than Democrats, who already hold strong environmental beliefs.

Together, these findings suggest that citizens update their views as cautious rather than perfect Bayesians (Hill 2017). In general, individuals seem to be motivated to form accurate opinions and not necessarily to confirm their preexisting ideological positions. Indeed, directional bias among Republicans manifests itself only when climate change is presented in ways that conflict with their identity and values. Nevertheless, it is still possible that polarization on climate change is driven by selective exposure to particular media content rather than motivated reasoning (Krosnick and Macinnis 2015).

This study makes several contributions. First, the results presented here demonstrate that although framing is often effective, it has clear limits (Druckman 2001a). The persuasiveness of environmental messages depends critically on whether they are framed in a manner that resonates or, at least, does not conflict with the political considerations of conservatives. Frames that may seem appealing to liberals and Democrats may fail at influencing the opinions of conservatives and Republicans, and vice versa.

This brings me to the second contribution of this chapter. It provides evidence about what types of frames are more successful in order to communicate scientific research on climate change and other politicized science topics. The findings show that communicating facts about climate change is a delicate endeavor (Druckman 2015; Lupia 2013; Farrell, McConnell, and Brulle 2019). When scientific research contradicts ideological positions, it is crucial to keep in mind the ideological characteristics of the target audience and spin controversial aspects in a manner that overcomes partisan bias.

Perhaps, the most concerning takeaway from this study is that highlighting environmental injustice might not be a productive tactic to reduce it. Racial and social minorities are suffering disproportionately from climate anomalies but this realization is not enough to move conservatives toward environmentalism. Future research should look into communication strategies that can mobilize collective action to protect the environment and redress inequalities in housing provision and healthcare access for those who are most affected by climate change. Further, scholars should investigate whether ideological reframing, whereby a policy incongruent to a citizen's ideology is framed in a manner that is congruent with that citizen's ideological values, is effective in issue-domains other than climate change. A final recommendation is to investigate whether exposure to different frames of climate change has an additive effect or whether the effects of contradicting frames negate each other.



## **CHAPTER 4**

### **Back To The Present**

#### **The Effect of Collective Memories on Public Support for Environmental and Counter-Terrorism Policies**

**Summary:** Although previous research has explored the formation of collective memories, there is little understanding of their political consequences. I have conducted a large survey experiment to test whether randomly stimulating memories of Hurricane Harvey and the 9/11 terrorist attacks affect preferences for environmental and counter-terrorism policies, respectively. Indeed, I find that collective memories directly increase public support for environmentalism and counter-terrorism. However, their impact is greater in the case of Hurricane Harvey than of 9/11. Further, citizens update their preferences in a similar manner regardless of their age, ideology, party identity, or degrees of trait authoritarianism and political awareness. The results suggest that collective experiences of the past shape present political attitudes but their impact may be subject to limitations.

Memories constitute an important building block of how individuals conceptualize themselves and their communities. The capacity to encode, store, and retrieve information about past events has a critical role in learning about politics as well as inventing or adopting social identities. Indeed, individual memory allows the accumulation of knowledge and can thus sharpen the wisdom of the masses when performing their democratic duties (Fiorina 1978; Arceneaux and Wielen 2017). Similarly, collective memory is necessary to construct the symbolic and cultural thread that binds pluralistic societies together (Swidler 1986; Boussaguet and Faucher 2017a).

Collective memories refer to the memories, experiences, and knowledge that are shared by individuals and enrich the identity of a social group. To a great extent, scholarly works have been limited to exploring the imprints from social and political events on the distinctive attitudes displayed by different generations (Mannheim [1928] 1952; Schuman and Scott 1989; Corning and Schuman 2015). Indeed, the 9/11 terrorist attacks represent a landmark for Millennials that distinguishes them from previous generations as well as from Generation Z (Dimock 2019; Deane, Duggan, and Morin 2016). Accordingly, members of Generation Z differ from previous generations most notably in the way they think about climate change and race (Parker and Igielnik 2020).

This chapter takes a somewhat opposite, yet complementary, approach to study collective memories. Its aim is not to investigate what events shape collective memories but rather to identify the effect of collective memories on preferences for policies to deal with ongoing risks. If collective memories serve as a shared pool of wisdom, it then follows that elites and citizens should draw on them when novel threats emerge.

Collective memories of wars and disasters can create political lock-ins that last for decades. Perhaps, one of the most illustrative examples of such a policy lock-in in the history of the U.S. is



isolationism, a principle of non-involvement in foreign affairs that dates back at least to the Monroe doctrine. During the 1930s, memories of the atrocities of World War I combined with the hardships of the Great Depression led the American public to support the withdrawal of the U.S. from international politics. This support was interrupted only when the stakes of World War II became too high to remain passive. Similarly, the tragic experience of the Vietnam War influenced Americans' reluctance to get into another quagmire until the outbreak of the First Gulf War.

Environmental disasters can also change public perceptions of the urgency to take environmental action. In 1969, the Cuyahoga River caught fire as a result of being heavily polluted by industrial activities in Cleveland, Ohio. The disaster sparked a fervent debate that resulted to the adoption of several emblematic environmental policies. A year later, Nixon signed the executive order establishing the Environmental Protection Agency (EPA), an independent executive agency that deals with issues of environmental protection and climate change. In 1972, Congress passed the Clean Water Act, which remains to this date the primary federal law governing “discharges of pollutants into the waters of the United States and regulating quality standards for surface waters” (US EPA 2013).

The question then is, can collective memories of past threats affect individual policy preferences to address current challenges? I argue that when collective memories of past natural disasters and terrorist attacks are stimulated, citizens update their preferences for environmental and counter-terrorism policies, respectively. More specifically, collective memories of such events should have a positive direct impact on public support for policies both on average and across different subgroups of the population.

The substantive focus of the study influences the methodological tools I employ. Instead of relying on interviews and observational cross-sectional and longitudinal data as previous

literature does, I experimentally prime participants to recall memories from past crises. Priming collective memories of past crises both constrains the content of these memories and brings in information that is not readily accessible. In other words, rather than the effect of collective memories *per se*, the study examines the effect of priming collective memories rather than the effect of collective memories.

To investigate the causal effect of evoking collective memories on preferences for environmental and counter-terrorism policies, I fielded a survey experiment, the first to my knowledge, on the political consequences of collective memory. I randomly exposed participants to a clip presenting a timeline of Hurricane Harvey and the 9/11 terrorist attacks as well as showing footage from these two events.

Hurricane Harvey occurred in August 2017 and impacted mostly Texas and Louisiana. It is tied with Hurricane Katrina as the costliest tropical cyclone on record causing \$125 billion in infrastructure and property damage and the death of 107 people. To this day local communities organize remembrance ceremonies annually while the World Meteorological Organization announced that the name *Harvey* will never again be used for another Atlantic tropical storm due to the disaster and loss of life it caused. On the other hand, September 11, 2001 is one of the darkest days in American history. The terrorist Islamist group Al-Qaeda carried out a series of terrorist attacks against the World Trade Center in Manhattan, New York City and the Pentagon, headquarters of the U.S. Department of Defense in Washington, DC. These attacks claimed the lives of 2,977 civilians and caused an estimated damage of at least \$10 billion. In remembrance of this tragedy, September 11 has been designated as Patriot Day and many commemorations take place each year across the U.S.

In two experimental interventions, I find that collective memories of Hurricane Harvey and the 9/11 terrorist attacks increase preferences for environmental and counter-terrorism policies, respectively. In the first part of the study, stimulating collective memories of Hurricane Harvey leads subjects to report higher concern about global warming and the occurrence of another large flood. Moreover, they increase their support for disaster relief measures and for a number of policies to combat climate change, even at the expense of the American economy.

In the second part of the study, priming subjects with collective memories of the 9/11 attacks spurs their concerns about terrorism and makes them more supportive of launching an attack against Iran as well as of counter-terrorism measures that restrict civil liberties. However, the impact of collective memories is not equally strong in the two interventions with the effects of memories of Hurricane Harvey dwarfing those of the 9/11 attacks. Importantly, in both interventions and across 125 model specifications, citizens update their opinions in parallel irrespective of their age, party identity, ideology, and the degree of their political awareness and trait authoritarianism.

## **MEMORY AND COLLECTIVE MEMORIES**

Memory has long been the subject of multidisciplinary research in social and natural sciences. Before I turn my focus to collective memory, which is of particular interest in this study, it is helpful to distinguish it from other types of memory as well as to highlight its similarities with them. A broad classification of human long-term memory is between explicit (declarative) memory and implicit (non-declarative) memory (Schacter and Tulving 1994; Barco, Bailey, and Kandel 2006). In contrast to implicit memory, explicit memory describes the conscious and intentional

recollection of previous events and factual information. Indeed, the collective memories I investigate here are necessarily characterized by a certain level of intent even though they may also include components that remain elusive to consciousness.

Collective memory is often compared with two other types of memory, autobiographical and flashbulb memories. On the one hand, autobiographical memories involve the recollection of episodes from an individual's life combining memories of a particular event with general knowledge about the world (Rubin, Rahhal, and Poon 1998; Schmidt 2004). Autobiographical memories follow patterns of creation and retention similar to those of collective memories but they are developed in earlier ages and precede the formation of collective memories (Schuman and Corning 2014).

On the other hand, flashbulb memories refer to long-lasting and vivid memories of the context in which an individual received a piece of consequential and emotionally arousing news (R. Brown and Kulik 1977; Neisser and Harsch 1992). In psychology, there is a rich literature analyzing the role of natural disasters and terrorist attacks in creating memories of both types (Curci and Luminet 2006; Davidson, Cook, and Glisky 2006; Greenberg 2004; Schmidt 2004; N. R. Brown et al. 2009).

Nevertheless, the study of collective memory has attracted the attention of social scientists other than psychologists (but see Hirst and Manier 2008; Roediger and Abel 2015). The French philosopher and sociologist Halbwachs ([1925] 1992) was the first to introduce the term that refers to individual memories of past events that are shared by members of a group. Ever since, an important body of mostly theoretical accounts has been developed that link collective memories to collective identities and cultural trauma (Alexander et al. 2004; Demertzis 2020). But in modern empirical research, which is heavily influenced by methodological individualism, collective

memory represents a conceptual oxymoron (Olick 1999). Indeed, only individuals have the capacity to remember, despite the fact that “[i]t is in society that people normally acquire their memories. It is also in society that they recall, recognize, and localize their memories” (Halbwachs [1925] 1992: 28).

The formation of collective memories during critical periods of the life cycle has been linked to the emergence of new generations (Mannheim 1928). Collective memories are formed during late adolescence and early adulthood and shape an idiosyncratic personal outlook on politics (Schuman and Scott 1989). Major events occurring when individuals are between the ages of 10 and 30 define their perceptions of reality and affect their responses to subsequent events (Schuman and Corning 2012; 2016).

These findings resonate with research coming from the literature on political socialization. Perhaps the most ambitious effort to study generational, life cycle, and historical effects is the Youth-Parent Socialization Panel Study, which includes four waves of surveys with the same national sample between 1965 and 1997 (Jennings et al. 2005). Indeed, in a series of seminal studies Jennings and colleagues find that children tend to exhibit similar political orientations with their family contingent on the strength of parental cues and the particular events that happen during their late adolescence or early adulthood (Jennings and Niemi 1975; Jennings, Stoker, and Bowers 2009; Jennings and Niemi 1981; Beck and Jennings 1991; also Grasso et al. 2017).

To analyze the continuity and divergence of political opinions across generations the bulk of the relevant literature relies mostly on cross-sectional and panel observational data. However, recent research has employed more sophisticated econometric tools to analyze the causal impact of the Vietnam draft lottery status on political attitudes (Erikson and Stoker 2011), the trauma of the slave trade on political mistrust in Africa (Nunn and Wantchekon 2011), the historical origins

of anti-Semitic violence in Nazi Germany (Voigtländer and Voth 2012), and the cultural tolerance of corruption across generations (Simpser 2020).

## **COLLECTIVE MEMORIES OF NATURAL DISASTERS AND TERRORISM**

Wars, terrorist events, and natural disasters are often used as political landmarks because of the devastation they create and the changes in the way of life they trigger. These events are particularly memorable because both the government and the media invest much time and effort to provide narratives, frames, and justifications that can unite the nation and restore social order (Edelman 1971; Norris, Kern, and Just 2003; Kuypers 2006). To forge a national consensus elites function as “memory entrepreneurs” and organize commemorative ceremonies that are heavily mediatized (Hoskins 2009; Boussaguet and Faucher 2017b; Xu 2018).

There is a rich literature that underscores the prominence of security threats in the American collective memory (Corning and Schuman 2013; Schuman and Corning 2012; Hakim and Adams 2018; Tidball et al. 2010). A large majority of American citizens believes that the 9/11 terrorist attacks are the most important national event since the 1930s (Schuman and Rodgers 2004). In a panel study conducted before and after 9/11, Schuman and Corning (2016) find that the effects of terrorist attacks on collective memories were immediate and especially strong among younger generations. Although these events seem to stick in the collective mind, more dramatic but simple events, such as the assassination of Kennedy or the Gulf War, tend to fade from collective memory as the generations that lived them are replaced by new ones.

In a similar manner, natural disasters have enriched the reservoir of memories shared by national and local communities. Memories of massive floods deteriorate the mental health of

individuals in impacted and neighboring regions regardless of whether they personally experienced them (Philippe and Houle 2020). Further, memories of natural disasters are associated with lower optimism about future risk (Weinstein et al. 2000). However, these collective memories also have positive externalities. Following Hurricane Katrina, citizens in New Orleans engaged in activities of community forestry in order to honor the victims of the disaster (Tidball et al. 2010). Importantly, collective memories of natural flooding disasters have an adaptive value in that they lead impacted populations to create new settlements in safer locations (Fanta, Šálek, and Sklenicka 2019).

Although scholars have extensively studied how, when, and why particular events influence the formulation of collective memories, research has largely neglected to investigate the direct effects of these memories on political attitudes and policy preferences. Evidence shows that collective memories of racial lynching and the civil rights movement are associated with racially liberal opinions and greater propensity to participate in activist efforts (Griffin and Bollen 2009; Harris 2006). Memories also shape responsibility attribution after natural disasters. Memories of the generosity of flood aid by the state and federal government lead Louisiana citizens impacted by Hurricane Katrina to rate FEMA higher than state government agencies in later disasters. Further, stimulating memories of the 9/11 attacks increases public support for President Bush, patriotic symbols, and the war in Iraq (Lambert et al. 2010). However, Schuman and Rieger (1992) find little support that collective memories of past wars affect attitudes toward subsequent wars.

Past experiences can also shape public opinion indirectly through activating attitudinal predispositions. Sears (2001) argues that predispositions are acquired through classical conditioning in early phases of life and represent a latent but strong force in individuals' belief systems. Dramatic events, such as terrorist attacks and natural disasters, can evoke relevant

memories of the past and bring these forces into play. Indeed, collective experiences of such events can affect how citizens organize their memories (N. R. Brown et al. 2009) and trigger attitude shifts toward conservatism, authoritarianism, and nationalism (Bonanno and Jost 2006; Nail and McGregor 2009). Importantly, in the wake of national crises elites can strategically exploit the reservoir of collective memories to justify their initiatives and increase public support for controversial policies (Kuypers 2006). Accordingly, I hypothesize that collective memories of terrorist attacks and natural disasters may affect opinions indirectly through activating national attachment and authoritarian attitudes (*H1*).

## **COLLECTIVE MEMORIES AND POLICY PREFERENCES**

To test the impact of collective memories on present policy preferences, I draw on three theoretical approaches. The Bayesian Learning Model, Zaller's Receive-Accept-Sample (RAS) model, and motivated reasoning provide different expectations about the effect of collective memories of natural disasters and terrorist attacks on preferences for relevant policies. More specifically, they offer divergent answers as to which is the expected direction of the effect and which subgroups of the public will update their opinions.

The Bayesian Learning Model predicts that citizens change their attitudes by conditioning their prior opinions on the difference between these priors and new information. Although memories do not represent, by definition, new information, stimulating collective memories increases their salience and can enrich the manner in which individuals think about past events. Depending on the likelihood function, the Bayes' rule is compatible with a variety of conflicting expectations but generally predicts that individuals update their opinions in a reasonable fashion



(Druckman and McGrath 2019). This prediction resonates with the parallel publics thesis articulated by Page and Shapiro (1992). Indeed, analyzing fifty years of trends in policy preferences, Page and Shapiro demonstrate that the American public as a collective expresses meaningful opinions, which evolve in parallel across decades regardless of demographic and political characteristics. At the individual level, the parallel publics thesis is consistent with the hypothesis that citizens change their preferences in the direction of evidence ( $H_{2a}$ ) and regardless of their background attributes ( $H_{2b}$ ).

In contrast, Zaller develops a memory-based model of public opinion, which underscores the importance of predispositions. The RAS model posits that citizens metabolize new information into opinions only if they are sufficiently engaged with an issue and this information does not conflict with their political values and social identities (Zaller 1992). According to the RAS model, political awareness, the level of cognitive involvement with an issue, should be a strong moderator of how citizens respond to the stimulation of collective memories. Citizens who exhibit higher levels of political awareness should be able to retrieve memories of events that happened further in the past (e.g., the 9/11 terrorist attacks) but ultimately their response should depend on their political beliefs ( $H_{3a}$ ). An alternative hypothesis is that citizens, who score high in political awareness, may be less affected by the manipulation of these memories because these events are chronically salient to them ( $H_{3b}$ ).

Theories of motivated reasoning make similar predictions to the RAS model but emphasize the role of political identities and ideologies. Overall, these theories argue that citizens are motivated to give greater weight to information that is congruent with their political predispositions than to arguments that negate their prior positions. The first study of motivated reasoning comes from Hastorf and Cantril (1954), who show that members of the crowd in a

college football game expressed different accounts of the game depending on which team they were rooting for. Indeed, much of the recent research supports these findings (Kahan et al. 2012; Lodge and Taber 2013).

Motivated reasoners often discard pieces of factual information about past events that contradict their beliefs and instead use affective appraisals as a running tally to make political decisions (Redlawsk 2006). Moreover, individuals may use these affective appraisals to reconstruct their memories in ways that confirm their prior beliefs and alleviate normative or empirical contradictions (Peters and Gawronski 2011). A hypothesis that logically derives from this framework is that collective memories will impact the opinions of certain subgroups of the population more than of certain others. Conditional on their framing, collective memories of terrorism, an issue that is more salient among conservatives, Republicans and authoritarians, should impact their opinions more than collective memories of natural disasters, a manifestation of climate change which is typically a policy area that is captured by liberals and Democrats ( $H_{4a}$ ). Conversely, if these memories are more vivid for these subgroups in their everyday life, they should be less likely to change their mind after being primed ( $H_{4b}$ ).

## **SUMMARY OF THE ARGUMENT**

I argue that evoking collective memories of Hurricane Harvey and the 9/11 terrorist attacks will cause citizens to update their opinions in a reasonable way by increasing their preferences for environmental and counter-terrorism policies. More concretely, collective memories of these events should have a positive direct effect on public support for policies regardless of citizens' background characteristics and beliefs.

## RESEARCH DESIGN AND METHODS

To test my empirical hypotheses, I conducted a survey experiment between June 23 and July 5, 2020. The survey comprises three experimental arms and was administered by Lucid with a nationally diverse sample of American citizens ( $N = 1,825$ ).<sup>1</sup> To increase statistical precision, a total of 929 subjects were randomly allocated to the placebo group. Accordingly, treatment groups 1 and 2 include 447 and 451 subjects, respectively.

### *Procedure*

After answering a baseline survey, subjects were randomly assigned to one of three groups. All treatments consisted of a clip that lasted approximately 2 minutes and primed participants to recall collective memories. To measure outcomes subjects had to fill out a questionnaire after receiving the treatment.

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<sup>1</sup> Coppock and McClellan (2019) report that samples on Lucid are more similar to representative probability samples than their counterparts on MTurk in almost every observable characteristic. The original study also included a third intervention that aimed to manipulate exposure to national symbols but this analysis is beyond the scope of this chapter (total  $N = 2,234$ ). The survey experiment had a completion rate of 49.40%. and a duration of roughly 15 minutes. This research was reviewed and approved by the Institutional Review Board of Columbia University (IRB-AAAS7826).

In treatment group 1, subjects watched an original clip that informed about the intensity of Hurricane Harvey and the devastation it caused.<sup>2</sup> The clip included footage from flooded cities and rural areas, houses in ruins, rescue missions, and short interviews of survivors and first respondents. At the end of the clip, there was an image of a man carrying a woman and her baby in his arms to rescue them from a flooded area and subjects could read, “Never forget. We remember the heroes of Hurricane Harvey.”

Subjects in the second treatment group were invited to watch a similar clip about the 9/11 terrorist attacks.<sup>3</sup> The video included a timeline of the events featuring the two planes that were flown into the Twin Towers of the World Trade Center in New York, the attack against the Pentagon in Washington, DC, panicked people mourning and running in the streets of New York, and first respondents helping them to safety. As in the first treatment group, in the last scene of the clip subjects could see an image of the Twin Towers and a message reading, “Never forget. We remember 9/11.” Finally, subjects in the placebo group watched a news story about the apple-picking season in New York.

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<sup>2</sup> Although the economic damage that Hurricane Harvey caused is tied with that of Hurricane Katrina in 2005, Hurricane Katrina was significantly deadlier, with a total of 1,833 deaths. However, it was a deliberate choice not to draw on the case of Hurricane Katrina as the events were heavily politicized and race played a critical role. To keep the treatment as clean as possible, I decided to stimulate memories of Hurricane Harvey instead.

<sup>3</sup> The clip was originally made and published by ABC13 Houston to commemorate the tragic events of 9/11 and was edited to reduce its duration.

## *Analytic Strategy*

There are two estimands of interest, the Average Treatment Effect (ATE) and the Conditional Average Treatment Effect (CATE). The ATE is the difference between the average outcomes in the treated and untreated conditions. To avoid issues with multiple testing, the ATE is obtained separately for each pair of outcomes. I compute difference-in-means estimates with bivariate linear regressions while multivariate regressions adjust for pre-treatment covariates. In fact, the latter estimates should be considered more precise (the balance test can be found in Tables A1 and A2 in Appendix). Heteroskedasticity-consistent (HC1) standard errors are computed when needed.

Further, I estimate the Conditional Average Treatment Effect, that is the ATE for different subgroups of the sample. The CATE is estimated by adding a treatment-by-covariate interaction in the multivariate models to explore heterogeneous treatment effects across age, ideology, party identity, and degrees of political awareness and trait authoritarianism, separately. Finally, to compare the simple multivariate models to the interactive models I estimate a total of 125 F-tests.

## *Measures*

Before treatment assignment, subjects answered a series of questions about their demographic characteristics, political interest, ideology, party identity, and trait authoritarianism. To gauge political awareness, I construct a scale of education and political interest (Zaller 1992). Further, I tap into trait authoritarianism with an additive scale of four items measuring child-rearing values (Pérez and Hetherington 2014). The post-treatment questionnaire measured

attitudes toward climate change, natural disasters, counter-terrorism policies, national attachment, and authoritarian attitudes.<sup>4</sup> All variables were normalized to range from 0 to 1.

I measured public concerns about global warming and natural disasters with two measures.<sup>5</sup> The first question asked, “Assuming it’s happening, if nothing is done to reduce global warming in the future, how serious of a problem do you think it will be for the world?” The second item asked about how concerned subjects are that there will be another large flood. Further, subjects were asked whether, under budget constraints, the government should provide federal relief to citizens hit by natural disasters or invest in long-term environmental policies. Subjects also had to take a position on whether the government should or should not put a cap on the amount of greenhouse gasses that U.S. businesses emit, even if this measure hurts them, to reduce the prospects of a future natural disaster.

In addition, subjects answered a series of questions about their preferences for environmental policies. More specifically, they were asked whether they favor or are opposed to offering companies tax breaks to produce electricity from renewable resources, imposing a

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<sup>4</sup> Depending on treatment assignment, subjects received the relevant battery of outcome measures first and then were presented with the remaining questions. That is, subjects that were exposed to the Hurricane Harvey treatment answered the questions about climate change and natural disasters first and then proceeded with the questions about counter-terrorism and vice versa for subjects that were assigned to the 9/11 treatment.

<sup>5</sup> Apart from original questions, the survey used items developed by the Political Psychology Research Group at Stanford University in their research on the American Public Opinion on Global Warming and scholars at the Yale Program on Climate Change Communication.

pollution tax on companies and providing funding for research into renewable energy sources. Accordingly, three questions tapped into public support for disaster relief measures, including financial assistance, free housing, and free healthcare to victims of natural disasters. These items were then submitted to principal axis factor analysis with *promax* rotation (see Table A3 in Appendix) and were added to create scales for preferences for long-term environmental policies (*Cronbach's alpha* = 0.806), disaster relief measures (*Cronbach's alpha* = 0.887), and attitudes toward both types of environmental policies (*Cronbach's alpha* = 0.884).

Regarding terrorism, an item asked how concerned subjects were about another terrorist attack happening in the near future. To measure public preferences for counter-terrorism policies, I asked how much subjects favored or opposed shutting down the borders, deporting immigrants, deporting Muslims, launching a drone strike in Iran, expanding the war on terrorism to Iran and other hostile countries,<sup>6</sup> deploying troops in U.S. cities, using torture to interrogate suspected terrorists, and censoring social media. Similar to items gauging environmental attitudes, I conducted principal axis factor analysis with *promax* rotation (see Table A4 in Appendix) and created a scale for attitudes toward defensive policies (*Cronbach's alpha* = 0.833), confrontational policies (*Cronbach's alpha* = 0.838), and overall counter-terrorism policies (*Cronbach's alpha* = 0.896). At the end of the survey, there were two batteries of questions measuring different types of national attachment (Kosterman and Feshbach 1989; Huddy and Khatib 2007) and right-wing authoritarian attitudes (Bizumic and Duckitt 2018).

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<sup>6</sup> I focus on Iran because of the tensions that escalated between the Iranian government and the US in 2020.

## EMPIRICAL RESULTS

I organize the analysis in four sections. In the first section, I present the results of the first intervention that instigates the impact of collective memories of Hurricane Harvey on preferences for environmental policies and disaster relief measures. The second section describes the findings of the second intervention, which focuses on the effect of collective memories of the 9/11 terrorist attacks on public support for counter-terrorism policies. In the following section I explore heterogeneous effects across age, degrees of political awareness and trait authoritarianism, ideology, and party affiliation. Finally, I investigate the indirect effects of collective memories through activating national attachment or rightwing authoritarian attitudes.

In sum, I find that the effects of collective memories on policy preferences are substantively medium to small and range from 2.6 to 10.3 percentage points. Further, attitude change occurs in parallel irrespective of individual attributes and political beliefs. Indeed, across 125 conditional models I report consistent evidence that heterogeneous effects are overwhelmingly absent. The only exception is political awareness, which weakly moderates the impact of collective memories of the 9/11 attacks on preferences for certain counter-terrorism policies. Finally, I find no empirical support that national attachment or right-wing authoritarianism mediates treatment effects.

### *Collective Memories of Hurricane Harvey*

In this section, I investigate the effects of collective memories of Hurricane Harvey on environmental attitudes. The results in Table 1 suggest that remembering past experiences of natural disasters affects prospective evaluations of global warming and climate anomalies. Indeed,



stimulating collective memories of Hurricane Harvey increases the propensity to report concerns about future floods by 10.3 percentage points ( $p < 0.001$ ) and that global warming is a serious problem by 4.4 p.p. ( $p = 0.011$ ).

Table 2 shows the results from three additional tests. Treated individuals increase their overall demand for environmental action by 3.8 p.p. ( $p = 0.002$ ) and support environmental policies even if they hurt the U.S. economy by 4 p.p. ( $p = 0.038$ ). However, exposure to the clip about Hurricane Harvey leads citizens to become more shortsighted on average, as it leads them to report that the government should prioritize, under budget constraints, taking disaster relief measures over adopting long-term environmental policies ( $\widehat{ATE} = -0.063$ ,  $p = 0.056$ ). This is consistent with previous findings showing that citizens are myopic in their preferences for environmental policies (Healy and Malhotra 2009).

Table 4.1 The direct effects of memories of Hurricane Harvey on environmental concerns

	Environmental Concerns			
	Global warming is a serious problem		Concerned that there will be another large flood	
	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>				
ATE	0.046	0.044	0.101	0.103
(SE)	(0.017)	(0.017)	(0.017)	(0.018)
<i>p-value</i>	<i>0.007</i>	<i>0.011</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>
Intercept	0.753	0.822	0.553	0.429
(SE)	(0.010)	(0.044)	(0.010)	(0.043)
Covariates	No	Yes	No	Yes
N	1285	1034	1258	1015

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 4.2 The direct effects of memories of Hurricane Harvey on environmental attitudes

	Environmental Attitudes					
	Economy vs. Environment		Long-term vs. Short-term policies		Environmental policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>						
ATE	0.047	0.040	-0.049	-0.063	0.041	0.038
(SE)	(0.019)	(0.019)	(0.030)	(0.033)	(0.012)	(0.012)
<i>p-value</i>	<i>0.013</i>	<i>0.038</i>	<i>0.107</i>	<i>0.056</i>	<i>0.001</i>	<i>0.002</i>
Intercept	0.709	0.764	0.456	0.474	0.765	0.801
(SE)	(0.011)	(0.045)	(0.018)	(0.077)	(0.077)	(0.032)
Covariates	No	Yes	No	Yes	No	Yes
N	1200	982	1128	942	1143	942

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Next, I present the effects of collective memories on preferences for long-term environmental policies. As can be seen in Table 3, individuals become slightly more supportive of long-term policies by 2.6 p.p. ( $p = 0.063$ ). Although the treatment marginally increases public support for funding research on clean energy ( $\widehat{ATE} = 0.027$ ,  $p = 0.074$ ), it does not affect attitudes toward giving tax breaks to environmentally responsible companies ( $\widehat{ATE} = 0.017$ ,  $p = 0.318$ ) or imposing a pollution tax ( $\widehat{ATE} = 0.024$ ,  $p = 0.154$ ).

Table 4.3 The direct effects of memories of Hurricane Harvey on preferences for long-term environmental policies

	Long-term Environmental Policies							
	Tax breaks to companies		Pollution tax to companies		Fund more green research		Long-term policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>								
ATE	0.027	0.017	0.021	0.024	0.032	0.027	0.028	0.026
(SE)	(0.016)	(0.017)	(0.016)	(0.017)	(0.014)	(0.015)	(0.013)	(0.014)
<i>p-value</i>	<i>0.089</i>	<i>0.318</i>	<i>0.184</i>	<i>0.154</i>	<i>0.025</i>	<i>0.074</i>	<i>0.038</i>	<i>0.063</i>
Intercept	0.728	0.713	0.771	0.834	0.788	0.824	0.762	0.792
(SE)	(0.009)	(0.037)	(0.009)	(0.039)	(0.008)	(0.034)	(0.008)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1242	1017	1263	1025	1293	1046	1188	979

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

In Table 4, I report that evoking collective memories of Hurricane Harvey reinforces preferences for short-term disaster relief measures by 4.5 p.p. providing ( $p < 0.001$ ). Accordingly, individuals increase their support for providing financial relief to victims of natural disasters by 3 p.p. ( $p = 0.031$ ) and offering access to free housing and healthcare services by 5.4 and 5.2 p.p., respectively ( $ps < 0.001$ ).

Table 4.4 The direct effects of memories of Hurricane Harvey on preferences for short-term disaster relief measures

	Short-term Disaster Relief Measures							
	Financial relief to victims		Free housing to victims		Free healthcare to victims		Short-term policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>								
ATE	0.037	0.030	0.054	0.054	0.056	0.052	0.050	0.045
(SE)	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)
<i>p-value</i>	<i>0.005</i>	<i>0.031</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>
Intercept	0.797	0.812	0.756	0.803	0.765	0.822	0.775	0.814
(SE)	(0.008)	(0.037)	(0.009)	(0.038)	(0.009)	(0.037)	(0.008)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1296	1045	1284	1032	1277	1028	1244	1005

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

### *Collective Memories of the 9/11 Terrorist Attacks*

I proceed to turn my focus to the impact of collective memories of the 9/11 terrorist attacks on counter-terrorism policies. Tables 5-7 show that the impact of memories on attitudes toward counter-terrorism is minimal. Treated individuals become more concerned about terrorism by 3.4 p.p. ( $p = 0.064$ ) and increase their demands for confrontational policies ( $\widehat{ATE} = 0.037$ ,  $p = 0.036$ ).

Table 4.5 The direct effects of memories of the 9/11 terrorist attacks on counter-terrorism attitudes

	Counter-terrorism Attitudes							
	Concerned about terrorism		Counter-terror. policies (scale)		Defensive policies (scale)		Confrontational policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>								
ATE	0.021	0.034	0.021	0.023	0.009	0.006	0.028	0.037
(SE)	(0.018)	(0.018)	(0.019)	(0.017)	(0.019)	(0.018)	(0.019)	(0.017)
<i>p-value</i>	<i>0.233</i>	<i>0.064</i>	<i>0.270</i>	<i>0.172</i>	<i>0.640</i>	<i>0.731</i>	<i>0.148</i>	<i>0.036</i>
Intercept	0.610	0.263	0.452	0.144	0.393	0.104	0.475	0.159
(SE)	(0.010)	(0.040)	(0.011)	(0.038)	(0.011)	(0.040)	(0.011)	(0.038)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1248	1013	906	768	1152	953	938	793

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table 4.6 The direct effects of memories of the 9/11 terrorist attacks on preferences for counter-terrorism policies

	Counter-terrorism Policies (1)							
	Shut down the borders		Deport immigrants		Deport Muslims		Launch a drone strike in Iran	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>								
ATE	0.006	0.011	-0.015	-0.023	0.018	0.007	0.027	0.042
(SE)	(0.023)	(0.021)	(0.022)	(0.021)	(0.020)	(0.020)	(0.023)	(0.022)
<i>p-value</i>	<i>0.790</i>	<i>0.574</i>	<i>0.468</i>	<i>0.271</i>	<i>0.365</i>	<i>0.721</i>	<i>0.236</i>	<i>0.058</i>
Intercept	0.526	0.132	0.380	0.166	0.282	0.080	0.459	0.119
(SE)	(0.013)	(0.049)	(0.012)	(0.048)	(0.011)	(0.044)	(0.013)	(0.048)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1247	1016	1246	1014	1224	999	1081	892

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

However, public support for particular policies largely remains unaffected with two exceptions. The treatment boosts citizens' propensity to support a drone strike in Iran ( $\widehat{ATE} = 0.042$ ,  $p = 0.058$ ) and the censoring of social media for security reasons ( $\widehat{ATE} = 0.048$ ,  $p = 0.036$ ). These results are in line with evidence from Schuman and Rieger (1992) and suggest that stimulating memories of 9/11 may not be a particularly successful strategy to sway the American public toward backing restrictive measures in order to curb current threats of terrorism.

Table 4.7 The direct effects of memories of the 9/11 terrorist attacks on preferences for counter-terrorism policies (continued)

	Counter-terrorism Policies (2)							
	Expand war on terrorism		Deploy troops in U.S. cities		Torture suspected terrorists		Censor social media	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>								
ATE	0.024	0.025	0.021	0.035	0.001	0.036	0.031	0.048
(SE)	(0.021)	(0.020)	(0.023)	(0.022)	(0.022)	(0.022)	(0.021)	(0.023)
<i>p-value</i>	<i>0.251</i>	<i>0.228</i>	<i>0.344</i>	<i>0.120</i>	<i>0.948</i>	<i>0.100</i>	<i>0.149</i>	<i>0.036</i>
Intercept	0.567	0.195	0.441	0.104	0.393	0.226	0.495	0.186
(SE)	(0.012)	(0.048)	(0.013)	(0.049)	(0.012)	(0.049)	(0.012)	(0.049)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1139	944	1189	977	1227	1000	1225	1000

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

## *Heterogeneous Effects*

This section reports evidence about which subgroups of the population update their opinions when collective memories are evoked. Across 125 conditional models, I explore heterogeneous treatment effects with respect to age, ideology, party identity, and degree of trait authoritarianism and political awareness. The results of the analysis are found in Tables B1-B4 in Appendix B.<sup>7</sup>

Despite their constitutive role in the American public opinion, I find that party identity and ideology do not affect how collective memories spur public demands for environmental and counter-terrorism policies. Indeed, across 50 F-tests none of the F-values achieves statistical significance at the conventional 0.05 level. Moreover, none of the 25 F-tests about trait authoritarianism render significant results. Together, these findings contradict the expectations that stem from motivated reasoning ( $H_{4a}$  and  $H_{4b}$ ) and corroborate the parallel publics thesis that citizens update their views regardless of their background characteristics (Page and Shapiro 1992).

Contrary to Hypothesis 1 and much of the research in collective memory that employs observational methods, age does not moderate the effect of collective memories in any of the 25 conditional models. Finally, political awareness moderates, albeit weakly, the effect of collective memories of 9/11 (in 5 out of 13 model comparisons) of but not of Hurricane Harvey. Individuals who score higher in political awareness update their preferences for certain counter-terrorism policies more than their less politically aware counterparts. Although these effects are marginal,

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<sup>7</sup> An F-value that is inconsistent with the null hypothesis implies that the interactive model fits the data better than the nested multivariate model.

they are in line with expectations from the RAS model ( $H_{3a}$  but not  $H_{3b}$ ). Overall, I find little support that individual attributes moderate the impact of treatments. Instead, different segments of the public change their attitudes in parallel and toward the same direction in line with Hypotheses 2a and 2b.

### ***Alternative Mechanisms***

National crises often trigger a conservative shift that manifests itself into a surge of national attachment and authoritarian attitudes (Baker and Oneal 2001; Coryn, Beale, and Myers 2004; Stenner 2005; Hetherington and Suhay 2011; Vasilopoulos, Marcus, and Foucault 2018). The activation of these dispositions, in turn, predicts preferences for environmental and counter-terrorism policies (Cislak, Wojcik, and Cichocka 2018; Choma et al. 2019; Crowson, DeBaker, and Thoma 2005; Skitka et al. 2006).

Although mediation analysis requires strong assumptions (Bullock, Green, and Ha 2010), I take a first step to test the empirical validity of this psychological mechanism. I estimate ten difference-in-means models to explore the impact of treatments on rightwing authoritarian attitudes (Bizumic and Duckitt 2018) and four types of national attachment, patriotism, nationalism, internationalism, and symbolic patriotism (Huddy and Khatib 2007; Kosterman and Feshbach 1989). Results are shown in Table C15-16 in Appendix C. Because the treatment does not affect any of these attitudes, this preliminary analysis provides evidence that rules out these possible mediators, and thus disconfirms Hypothesis 1.



## CONCLUSION

Natural disasters and terrorist attacks are traumatic events that shape how citizens think about themselves and their community. When individuals encode and store these collective experiences in their memory, these memories forge a sense of national unity and enrich the wisdom of the masses. Although previous research has delved into which collective experiences are most memorable to which segments of the population, little has been written on the impact of collective memories on public preferences for policies addressing ongoing challenges. This study sought out to investigate this impact by applying an experimental approach rather than drawing on observational data as often done by previous literature.

I argued that stimulating collective memories of national crises would affect current public support for relevant policies. Importantly, this increase would occur independently of individual characteristics or political attributes. To test this hypothesis, I ran a large survey experiment with a nationally diverse sample of Americans. This experiment consists of two interventions that investigate the effect of collective memories of Hurricane Harvey and the 9/11 terrorist attacks.

In both interventions, I find consistent evidence that collective memories of these events increase preferences for environmental and counter-terrorism policies. Further, individuals update their views in a manner orthogonal to their age, party identity, ideology, and the degree of their political awareness and trait authoritarianism. Importantly, collective memories affect political attitudes directly rather than through activating national attachment or rightwing authoritarian preferences.

In the first intervention, priming individuals with collective memories of Hurricane Harvey raises their concerns about global warming and natural disasters. Accordingly, citizens reinforce

their support for environmental action. A caveat is that individuals become more myopic as they prefer short term disaster relief measures rather than long-term environmental policies. In contrast, stimulating collective memories of the 9/11 terrorist attacks in the second intervention triggers public concerns about terrorism but has limited impact on preferences for counter-terrorism policies.

Three reasons may explain the discrepancy between the strong effects of collective memories of Hurricane Harvey and the weaker influence of the 9/11 attacks. Although 9/11 is arguably one of the most dramatic events in recent history, for a significant part of the population it is already an old memory. Indeed, young adults in 2020 may not have even been born when the tragedy unfolded. Alternatively, it may be the case that the experimental manipulation was not effective because the imagery of 9/11 is still vivid today for many Americans. A last explanation could be that the restrictions of civil liberties and the wars that followed the terrorist attack have made the public wary of aggressive foreign policies. The latter two explanations seem more plausible as age did not moderate the effect of collective memories of 9/11 on public support for counter-terrorism.

This study makes several contributions to the literature of public opinion and collective memories. First, it uses experimental methods to test the effect of collective memories on policy preferences. Previous research mostly draws on observational cross-sectional and panel data to explore the correlates of collective memories and the long-term impact of historical events (Schuman and Rieger 1992; Griffin and Bollen 2009). However, these methods require heroic assumptions to extract causal inferences. Randomizing the stimulation of memories not only overcomes this limitation but also allows for control, at least to a certain degree, of the content of the memories that individuals retrieve.

Second, this chapter offers one of the first explorations of whether and how collective memories affect opinions about current issues. So far, little is known about how memories of past threats affect attitudes toward relevant ongoing challenges. A systematic study of these effects is of particular importance as political elites often leverage collective memories to frame new threats and sway public opinion on specific policies (Kuypers 2006; Norris, Kern, and Just 2003).

The present study is not exhaustive. The findings suggest that scholars should further examine the evocation of collective memories as a persuasive strategy. In this regard, two areas seem particularly promising for future research. Although I analyzed memories of events broadly perceived as negative, future research should delve more deeply into the consequences of other types of memories. For example, the election of President Barack Obama was a historic moment in American politics but its remembrance may fuel polarization in an era that is characterized by intense partisan animus. Similarly, memories of the Trump presidency, and especially the 2021 storming of the United States Capitol, will likely affect how U.S. citizens think about partisan brinkmanship.

A different area for future investigation is to identify the factors that moderate the effect of collective memories. Four of them are possibly of interest. First is the chronicity of memories. Dramatic events, such as the 9/11 attacks, can stick in people's minds and irreversibly shape their understanding of politics. Evoking these memories then may not bring an added value as people already take into account these events when thinking about relevant political issues. Another moderator could be the overuse of memories. After a certain point, when elites appeal to specific events or collective experiences, citizens may grow tired of them and perceive them as banal references to score easy political points. Third, scholars should look into the temporality of

collective memories. Indeed, collective memories of the distant past may be less effective in moving public opinion than memories of more recent events.

Finally, the persuasiveness of evoking collective memories may depend on the novelty these appeals carry. Collective experiences that are less remembered or forgotten aspects of well-known events may be more successful to move public opinion. As typical Americans only have a mediocre knowledge of history, there are many untold stories about the events that have defined their national identity. For example, one additional terrorist was put on trial after the 9/11 attacks, but was given life in prison rather than the death penalty, in part because of moving testimony from people who lost loved ones in the attack saying that the death penalty is barbaric and won't bring their loved ones back. Stories like this can affect how citizens think about terrorism and help cure national traumas.

# CONCLUSION

## Toward A (More) Reasonable Understanding Of Public Opinion

In this thesis, I argued that, under threatening conditions, citizens update their opinions in a reasonable and predictable manner. Conditional on their exposure to new information, individuals change their views by small amounts, in the direction of information, and in parallel. Across four experimental studies, I demonstrated that attitude change, when it occurs, is minimal and is not subject to a backlash effect. Further, citizens' opinions move toward the direction of the evidence regardless of their background characteristics. The only exception is that Republicans resist messages which frame controversial issues for them in ways that are threatening to their party identity and ideology (e.g., framing climate change in terms of racial justice). Finally, as a rule, information about a policy area does not affect unrelated attitudes, unless it appeals strongly to citizens' emotions and does not stimulate considerations relevant to said policy area.

### *Parallel updating: A comparative assessment of the four case studies*

Together, the findings from the four studies presented in this dissertation illustrate the analytical strength of parallel updating to explain patterns of attitude change (for an overview of the studies and their results, see Tables 5.1 and 5.2). In line with expectations stemming from the parallel publics thesis (Page and Shapiro 1992) and the Bayesian Learning Model (Hill 2017; Coppock, Hill, and Vavreck 2020), attitude change is small, occurs in the direction of information,

and exhibits little heterogeneity. I find that citizens update their issue positions at the margin of their political dispositions but these dispositions do not affect the direction or the magnitude of their attitude change. This implies that public opinion is relatively stable and does not fluctuate dramatically. As I only examine the impact of one additional piece of information on political opinions, the existence of large effects due to repeated exposure to coordinated, consistent, and coherent information flows cannot be ruled out.

Table 5.1. Description of experimental studies

Chapter	Type of Threat	Treatment	Outcomes
1	Terrorism	Partisan cues	Counter-terrorism policies
2	Pandemic	Disgust and/or information	<ul style="list-style-type: none"> <li>• Restrictive policies</li> <li>• Health attitudes</li> <li>• Racial attitudes</li> </ul>
3	Climate change/ Natural disasters	Framing	Environmental policies
4	<ul style="list-style-type: none"> <li>• Terrorism</li> <li>• Climate change/ Natural disasters</li> </ul>	Collective memories	<ul style="list-style-type: none"> <li>• Environmental policies</li> <li>• Counter-terrorism policies</li> </ul>

Across 1153 model specifications, I provide strong evidence that attitude change is more or less homogeneous. In the rare cases when heterogeneous effects are found, they occur due to ceiling effects and are incompatible with predictions that individuals are motivated to confirm their prior beliefs (Chapters 1 and 3). Attitude change is similar across types of messages, be they textual (Chapters 1-3) or audiovisual (Chapters 2-4), issue-specific (Chapters 1-4) or general (Chapter 2), explicitly persuasive (Chapters 1-3) or not (Chapters 2 and 4). Moreover, the effects of

interventions exhibit little heterogeneity regardless of the characteristics of the sender (partisan elites (Chapter 1), media outlets (Chapters 2 and 3) or unknown (Chapters 2 and 4)), and the characteristics of the receiver (degrees of political awareness, ideology, party identity, trait authoritarianism (Chapters 1-4), education (Chapter 3) or age (Chapter 4)). Importantly, these results are supportive of homogeneous treatment effects despite the fact that my empirical analysis does not apply a Bonferroni correction, which would further reduce the frequency of observing statistically significant heterogeneous effects.

Table 5.2. Summary of findings across four studies

Study	Magnitude of Effects (p.p.)	Direction of Effects	Heterogeneous Effects (%)	Spillover Effects
1	3.4 – 10.7	+	10.64% (23/216)	No
2	2.2 – 11.6	+	5.12% (16/312)	No except for the disgust treatment
3	2.8 – 6.8	+ except for the racial justice frame	4.12% (13/315)	No
4	2.6 – 10.3	+	3.22% (10/310)	No

*Note: In the first column, magnitude is measured in percentage points (p.p.). In the second column, a positive sign indicates that subjects update in the direction of evidence. The third column presents the frequency of heterogeneous effects in each study (the number of statistically significant F-values at the 0.05 level over the total number of F-tests is shown in parentheses). The fourth column indicates whether spillover effects are found across the treatment conditions in each experimental study.*

Nevertheless, my analysis does not preclude the possibility that there may be other sources of heterogeneity. I did not (and could not, given the scale of the studies) investigate the role of the great many psychological constructs that predict public opinion and political behavior, such as the

big five personality traits (Bakker, Schumacher, and Rooduijn 2020), social dominance orientation (Ponce de Leon, Wingrove, and Kay 2020), right wing authoritarianism (Crawford and Pilanski 2014), disgust sensitivity (Kam and Estes 2016), among others. Neither did I look into heterogeneous effects with respect to pretreatment priors, a limitation that does not allow for fully testing the predictions of the Bayesian Learning Model. A last caveat is that heterogeneity may be hidden in sources that are as yet unknown.

In addition, I find that spillover effects are rare. Spillover effects are observed when changes in one attitude result in changes in other attitudes. In Chapters 1, 3 and 4, the treatments that identify preferences for environmental and counter-terrorism policies do not have any downstream effects on attitudes that are not related to these policy areas, even if they are not completely irrelevant. Spillover effects are absent when the message is partisan and intends to persuade people to change their views (Chapter 1 and 3), when it is non-partisan and explicitly persuasive (Chapter 2 and 3), when it conveys a lot of factual information (Chapter 3), or when it is non-partisan and non-explicitly persuasive (Chapter 4).

In contrast, I report spillover effects only when the intervention is both strong and appeals to emotions (Chapter 2). This finding further qualifies the theoretical expectations from Brandt and Slegers (in press), who propose that spillover effects can be measurable if the intervention is intense. It is not necessarily the strength of interventions that generates spillover effects but their content. Spillover effects are detected only when interventions are strong and target emotions irrelevant to political issues (Chapter 2), not when non-political emotions are combined with political information (Chapter 2), or when they are rich in facts and details about a policy area (Chapter 3). This resonates with expectations from the RAS model that posits that “individuals answer survey questions by averaging across the considerations that are immediately salient or



accessible to them” (Zaller 1992, 49). Therefore, stimulating incidental emotions, without directly priming individuals with political considerations, may affect a larger repertoire of attitudes than offering detailed factual information about a policy area.

Although in general individuals are fairly reasonable, group-based and attitude-based cross-pressures may incite limited directional bias. In Chapter 1, I find that individuals respond to the presidential statement by increasing their preferences for counter-terrorism policies regardless of whether their party agrees with it. This result highlights the role of the U.S. President as Commander-in-chief in times of elevated terrorist threat. Nevertheless, when Republicans and authoritarians, but not Democrats, observe that there is elite consensus on how to deal with this threat they tend to resist the message (see also Morisi, Jost, and Singh 2019). This conservative asymmetry is even more remarkable in Chapter 3, where I show that Republicans do not update their opinions about environmentalism when climate change is framed as an issue of racial injustice. Contrary to Republicans, Democrats increase their demand for environmental policies even if the message is framed in conservative terms. Despite the fact that these slight asymmetries are not the rule but the exception, these findings add to the existing literature that documents asymmetries driven by individuals who identify themselves as conservatives or Republicans (Brady et al. 2019; Broockman and Skovron 2018; Jost 2017; cf. Ditto et al. 2018, who find that partisan bias is symmetric; and Lasala Blanco, Shapiro, and Wilke 2020, who find that partisan conflict is mostly symmetric across 40 years with certain asymmetries driven by Democrats becoming more liberal).

Finally, attitude change exhibits these attributes when studied in realistic contexts of high threat. The reported estimates in Chapters 1-3 are conservative since in these interventions I test the effect of receiving one additional piece of information about a topic that was particularly salient

when the survey experiments were fielded. Moreover, because these experimental studies were conducted in the wake of real-world crises, their external validity is enhanced. However, all four survey experiments draw on non-probability samples. This limitation may have a negative impact on the generalizability of the findings to the general U.S. population. Recent research shows that such concerns may be exaggerated as estimates from large convenience samples do not differ significantly from those obtained from representative pools of subjects (Coppock and McClellan 2019; Coppock 2019; Snowberg and Yariv 2021). A more serious threat to external validity arises from the obtrusiveness that characterizes survey experiments. Indeed, it is possible that individuals respond differently because they know their answers are studied (but see Mummolo and Peterson (2019) regarding the robustness of survey experiments against demand effects).

### ***Broader implications***

This thesis can inform policy making and political communication strategies in several ways. Overall, the findings suggest that there should be cautious optimism about the capacity of citizens to form understandable opinions and update them in a predictable manner. From a normative point of view, this is good news for the democratic theory as citizens are sufficiently equipped to influence policies and impose a democratic constraint on elites. Public opinion is not terribly flawed or capricious, and thus elites should take its demands seriously and manage the supply of policies responsibly. If politicians ignore these demands or do not provide adequate policies, the American public seems to have the necessary qualities to keep those in power accountable. In other words, the current challenges of the American democracy can be addressed with more democracy and deliberation, not less (Fishkin and Luskin 2005).

Conversely, elites should feel confident that if their messages are reasonable and reach the citizens, on average public opinion will respond predictably. Politicians and political communication strategists can anticipate that their campaign advertisements will be understood in a more or less accurate manner by all segments of the public and will move public opinion by a small amount toward the same direction. Importantly, it is not likely that backlash effects, i.e., updating in the opposite direction of the information, represent a severe communication threat. Therefore, elites should neither overestimate their capacity to change people's minds nor underestimate people's ability to learn about politics and inform their opinions.

However, opinion leaders should take into account several caveats. Public opinion exhibits little dynamic constraint, that is, updating views on a specific policy issue does not result in updating views concerning other more or less closely related issues. This suggests that political communication strategists should invest time, effort, and funds in advertising and information campaigns that focus on specific issues, without hoping that increasing knowledge about a certain policy area will impact preferences for other policy areas. Their job is further complicated by the need to include all these policy proposals in a cohesive and consistent political agenda. In other words, it does not suffice to explain why people should support a diverse set of policies but it is also needed to highlight how these policies are compatible with one another. Developing a political program and discourse that connects a multitude of policy issues in a meaningful manner can be proven to be a challenging enterprise that exceeds the cognitive horizons and attention span of ordinary citizens. Perhaps, a more cost-efficient strategy would be to pinpoint a limited set of core economic and non-economic demands that are salient to the public and supply comprehensive, bold policies that satisfy them in tandem.

Emotional appeals can help in this regard as they generate pervasive effects that extend beyond specific issues. Although emotions are commonly thought as destabilizing and irrational factors that decrease the quality of the public debate, a rich literature also documents the positive role of emotions in politics (e.g., Marcus, Neuman, and MacKuen 2000; Valentino et al. 2008; Sniderman, Brody, and Tetlock 1993). This dissertation provides evidence that emotions work as a glue that holds together unrelated attitudes and opinions. Activating emotional responses can enhance ideological constraint and facilitate a more global understanding of what the political stakes are during critical times. Importantly, emotions bring authenticity in a political era that is characterized by a deficit of empathy and sensibility. A darker side of stimulating emotions is dog whistling. As shown in Chapter 2, emotional appeals may spur antisocial instincts and create divisions on the basis of race, gender, social class, and other social identities. Indeed, during the course of the pandemic, the Asian minority has been targeted repeatedly as a consequence of factually unfounded but emotionally motivating accusations.

Another strategy to coordinate attitude change and increase the persuasiveness of messages is counter-framing. Counter-framing describes the framing of contentious and polarized issues by drawing on political values and identities that resonate with the target group. In Chapter 3, I show that this strategy is more effective than just diffusing scientific information about climate change. Counter-framing increases the pressure on individuals to reconcile preferences for policies that are normally considered to be incompatible with their worldview with values and identities that are central to their belief systems. This may lead skeptics to become more supportive of policies they oppose in principle. Nevertheless, counter-framing is not a panacea as the balance between appealing to the broader masses and pleasing their core supporters is delicate. On the one hand, presenting policy issues that are traditionally held by a particular ideological group or party as

compatible with values of rival groups can disappoint activists that appreciate ideological purity and discourage them from being vocal about their demands. On the other hand, political advertising that frames controversial policies in ways that threaten the economic interests and symbolic order of the target group risks being counterproductive.

Moreover, messages are influential whether they explicitly intend to persuade citizens or not. Citizens change their opinions not only when they are deliberately involved in a situation where they receive new information to make up their minds about a particular policy issue, but also in circumstances that are seemingly “innocent” and there is little intent or expectation to affect people’s beliefs. Evoking incidental emotions (Chapter 2) or priming people with collective memories of past threats (Chapter 4) can sway public opinion. Thus, citizens’ positions on issues are shaped by an ever-increasing and highly personalized flow of information, regardless of the intention to persuade on behalf of content creators. Of course, this is not news to professionals who are often called to contain the damage in the public image of politicians caused by their negligent behavior or statements, or by events that are interpreted in a different way from what it was expected.

Overall, the public follows its leaders, be they politicians or other opinion leaders. In Chapters 1, 2 and 3, I find that citizens respond to presidential statements, partisan cues, op-eds, news stories, and ideological and non-ideological frames by changing their views according to available information. Although these results do not preclude the possibility that these elite messages correspond to or are diffused in anticipation of public demands, the public does not ignore what political elites and the media have to say under threatening conditions. The most striking finding is that citizens are willing to cross partisan lines and rally behind the president

when national security is breached, even in this era of elevated political polarization and even if they perceive that there is partisan disagreement on how to deal with terrorism.

Parallel updating and polarization are not necessarily incompatible. The key finding of this thesis is that, *conditional on exposure to information*, the different segments of the public update their opinions in parallel, irrespective of their background characteristics. However, this finding does not refute the periodical existence of polarization. Instead, what it suggests is that political polarization may arise due to social sorting (Mason 2018) and the fragmented structure of the media environment (Prior 2007). In non-experimental environments, individuals can choose the people they communicate with, the media content they consume, and ultimately the messages they receive. It is therefore possible that polarization is a product of selective exposure, not motivated reasoning (Krosnick and Macinnis 2015). In sum, the results presented here do not explain why polarization occasionally occurs but do show that individual differences in the way people process information are not the most likely or strongest cause of polarization.

Finally, the public remains reasonable even under threatening conditions. Political entrepreneurs and communication strategists should not make the mistake to think that their leeway to manipulate public opinion is unlimited in critical periods. Across four studies, I demonstrate that attitude change in turbulent times follows the same predictable patterns as under normal circumstances (Page and Shapiro 1992; Coppock 2016). Citizens seem to be able to absorb and respond to information in an understandable fashion, even when they perform their duties in situations that spur emotional stress and activate cognitive and affective coping mechanisms to deal with threats. Political and opinion leaders should appreciate the relative competence of the public and address its concerns and demands with a sense of responsibility.

### *Avenues for future research*

This thesis does not and could not offer an exhaustive and written-in-stone account of how citizens update their views. Rather, the credibility of its conclusions rests on future replications. I invite scholars to replicate this work both directly and conceptually in order to test whether the results remain substantively the same when the experiments are conducted with different treatments, sample pools, and outcome measures and in different countries and contexts (for the experimental instruments, see Appendix D). Although this dissertation is the product of careful and ethical work, its quality can only be assessed in light of future studies which will validate, extend or dismiss its contributions.

I believe the work presented here can serve as a springboard to further explore seven promising areas of research. First, scholarly investigations should focus on the magnitude of effects generated by full-scale campaigns that promote a series of messages throughout a certain period of time. Although individual pieces of information have a small impact on attitudes, coordinated campaigns that diffuse coherent and consistent messages during a period of time may sway public opinion decisively in the long term. This could explain the “Great Awakening” (Yglesias 2019), the ongoing radical shift of a large segment of the American public, especially of younger generations and whites, to the economic left and cultural liberalism, e.g., racial justice, women’s and LGBTQI+ rights. This hypothesis has not yet been tested empirically or experimentally, at least to my knowledge.

Second, future research should adjudicate on the duration of attitude change. Across four studies, I report consistent evidence that persuasion effects are small but the research design does not allow for testing their duration. Contingent on the type and intensity of the intervention,

changes in opinions may last for several days (Coppock, Ekins, and Kirby 2018), months (Broockman and Kalla 2016), or even years (Jäger 2020). However, more research is needed in order to identify what makes messages potent and memorable in the long run and what cost-effective strategies are available for online and offline campaigns, electoral or otherwise. Until recently, it has been difficult to answer similar questions in a methodologically rigorous manner but emerging experimental designs, such as stepped-wedge randomized trials, offer the opportunity to overcome many of the past challenges (Hemming et al. 2015).

Third, it is important to look for the motivations that underlie attitude change. Despite the fact that this thesis argues that the public is reasonable in the way it responds to information and updates its opinions, it was not able to identify the mechanism behind this argument, namely whether individuals are motivated to be accurate or to confirm their prior beliefs. The diagnosis of causal mechanisms is not an easy enterprise as the researcher needs to take a leap of faith and make the assumption of sequential ignorability (Bullock, Green, and Ha 2010; Imai, Tingley, and Yamamoto 2013). Nevertheless, newly validated interventions to stimulate accuracy goals (Pennycook et al. 2021) combined with advances in conjoint experimental designs (Hainmueller, Hopkins, and Yamamoto 2014) offer the tools to identify which mechanism is more likely to explain attitude change without sacrificing methodological rigor.

Fourth, scholars should delve deeper into the origins of polarization in the U.S. and elsewhere. Despite the fact that I find little evidence in favor of treatment heterogeneity in the American case, future research should look for cases where individuals behave as motivated reasoners and respond to treatments differently depending on their predispositions. For example, elite cues or two-sided flows of incongruent information may incite polarization by prompting individuals to pick sides. Another cause of polarization can be selective exposure. As political



divisions become sharper, social sorting increases, and the fragmentation of the media environment proliferates, people are able to choose which messages they will receive and which messages they will avoid. The polarizing effects of selective exposure can be further aggravated by asymmetries in the access to information, as certain segments of the public, and in particular the most underprivileged, elders, and people with low digital literacy, are left behind in the market of information.

Fifth, the role of emotions in the political arena should be further investigated. One of the most striking findings of this thesis is that emotions can affect a wide variety of political attitudes. Although the study of the political consequences of emotions is still underdeveloped, the relevant literature has been growing rapidly for more than twenty years. The bulk of the relevant work draws on observational data to analyze how situational and dispositional emotions (e.g., anger, fear, enthusiasm, disgust) predict citizens' judgments and decisions but experimental investigations lag behind. The main obstacle is that emotional responses are often correlated at high levels with one another. Thus, experimentally manipulating discrete political or incidental emotions has proven to be a delicate enterprise. This thesis proposes a way forward to remove certain methodological obstacles (e.g., interventions that closely identify disgust) and provides evidence that invites further examination.

Sixth, future research projects should look into how the public responds in the wake of more endogenous threats, such as economic crises, racial and social inequalities or political scandals. Exogenous shocks, like the ongoing COVID-19 pandemic, amplify systemic threats and asymmetrically impact the lives of those who are less protected. It is, therefore, important to study how citizens adjust their political trust and policy preferences when they perceive that their leaders behave irresponsibly or neglect to care about the common good. The capacity of the public to

blame and reward elites is key for democracy to survive within multilevel governance structures, like those that exist in the U.S. and the E.U., which blur political responsibility.

Finally, an important area of research is related to the interplay of public opinion and political behavior. Scholars of public opinion usually focus their analysis on how individuals or groups form their opinions, organize them, and change them in light of new information but they rarely take the additional step to study how these opinions are translated into behavior. Consequently, there is but a limited number of investigations about how behavioral interventions alter opinions or, conversely, how exposure to information results in behavioral changes. For political and social scientists to serve their social mission and offer practical solutions to real-world problems, they should extend the frontiers of knowledge and provide a more comprehensive understanding of the qualities and limitations that characterize both the attitudes and behavior of citizens in modern liberal democracies.

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## ***Conclusion***

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## APPENDIX

### Appendix A: Summary statistics, Balance test, Manipulation check, Factor analysis

#### *Chapter 1*

Table A1. Summary statistics of baseline covariates

	Mean values of Baseline Covariates			
	Placebo	Presidential Address	Democratic Support	Democratic Opposition
Female	0.477 (0.499)	0.480 (0.500)	0.488 (0.500)	0.471 (0.499)
Age	0.515 (0.306)	0.511 (0.299)	0.518 (0.307)	0.520 (0.293)
White	0.705 (0.456)	0.693 (0.461)	0.671 (0.470)	0.703 (0.457)
Education	0.518 (0.284)	0.488 (0.275)	0.507 (0.282)	0.515 (0.291)
Income	0.369 (0.318)	0.358 (0.321)	0.372 (0.309)	0.355 (0.310)
Political Interest	0.601 (0.319)	0.601 (0.324)	0.582 (0.309)	0.622 (0.326)
Political Awareness	0.560 (0.235)	0.545 (0.238)	0.546 (0.239)	0.569 (0.248)
Party ID	0.459 (0.379)	0.455 (0.372)	0.410 (0.373)	0.463 (0.394)
Ideology	0.511 (0.286)	0.526 (0.290)	0.521 (0.276)	0.522 (0.301)
Trait Authoritarianism	0.560 (0.323)	0.544 (0.322)	0.589 (0.310)	0.557 (0.302)

*Note:* Entries are mean values of baseline covariates and the respective standard deviations in parentheses. All variables are rescaled to range from 0 to 1.

Table A2. Table of balance test

	Balance on Baseline Covariates					
	$T_{PA} - \text{Placebo}$		$T_{DS} - \text{Placebo}$		$T_{DO} - \text{Placebo}$	
	Difference	<i>p-value</i>	Difference	<i>p-value</i>	Difference	<i>p-value</i>
Female	-0.003	0.908	-0.011	0.682	0.005	0.841
Age	0.003	0.821	-0.002	0.886	-0.004	0.791
White	0.011	0.650	0.034	0.199	0.002	0.931
Education	0.030	0.055	0.011	0.465	0.003	0.827
Income	0.011	0.552	-0.003	0.852	0.013	0.445
Political Interest	0.0001	0.994	0.019	0.303	-0.021	0.254
Political Awareness	0.015	0.262	0.014	0.301	-0.009	0.510
Party ID	0.003	0.856	0.048	0.030	-0.004	0.842
Ideology	-0.014	0.393	-0.009	0.566	-0.011	0.548
Trait Authoritarianism	0.016	0.369	-0.028	0.108	0.003	0.849

**Note:**  $T_{PA}$  refers to the treatment of reading only the presidential address,  $T_{DS}$  and  $T_{DO}$  refer to the treatment of reading that Democrats support or oppose the presidential address, respectively. All variables are rescaled to range from 0 to 1.

Table A3. Exploratory factor analysis of preferences for counter-terrorism policies

	Factor Analysis of Preferences for Counter-terrorism Policies	
	Confrontational Policies	Defensive Policies
Shut down the borders	0.338	<b>0.462</b>
Deport Immigrants		<b>0.880</b>
Deport Muslims		<b>0.778</b>
Launch a drone strike in Iran	<b>0.788</b>	
Expand war on terrorism	<b>0.914</b>	-0.121
Deploy troops in U.S. cities	<b>0.509</b>	
Torture of suspected terrorists	<b>0.517</b>	0.162
Censor social media	<b>0.409</b>	0.117
<i>Cronbach's Alpha</i>	<i>0.796</i>	<i>0.825</i>

*Note:* Entries are factor loadings submitted to promax rotation. Factor loadings greater than 0.4 are shown in bold.

## Chapter 2

Table A1. Summary statistics of baseline covariates

	Summary Statistics of Baseline Covariates			
	Placebo	Disgust	Information	Disgust x Information
Female	0.521 (0.499)	0.531 (0.499)	0.556 (0.497)	0.535 (0.499)
Age	0.565 (0.312)	0.538 (0.310)	0.551 (0.318)	0.531 (0.314)
White	0.734 (0.442)	0.674 (0.469)	0.664 (0.473)	0.722 (0.449)
Education	0.513 (0.277)	0.509 (0.273)	0.515 (0.278)	0.528 (0.283)
Income	0.363 (0.316)	0.362 (0.319)	0.390 (0.320)	0.360 (0.308)
Political Interest	0.609 (0.326)	0.619 (0.324)	0.619 (0.324)	0.619 (0.309)
Political Awareness	0.561 (0.235)	0.565 (0.229)	0.568 (0.241)	0.577 (0.233)
Party ID	0.487 (0.387)	0.453 (0.378)	0.434 (0.383)	0.456 (0.381)
Ideology	0.542 (0.290)	0.509 (0.279)	0.519 (0.286)	0.511 (0.279)
Trait Authoritarianism	0.571 (0.308)	0.546 (0.310)	0.547 (0.319)	0.529 (0.309)

*Note:* Entries are mean values of baseline covariates and the respective standard deviations in parentheses. All variables are rescaled to range from 0 to 1.

Table A2. Table of balance test

	Balance on Baseline Covariates					
	T <sub>DIS</sub> – Placebo		T <sub>INFO</sub> – Placebo		T <sub>INFODIS</sub> – Placebo	
	Difference	<i>p-value</i>	Difference	<i>p-value</i>	Difference	<i>p-value</i>
Female	-0.009	0.731	-0.035	0.203	-0.014	0.602
Age	0.027	0.122	0.014	0.427	0.034	0.048
White	0.060	0.019	0.070	0.007	0.013	0.609
Education	0.004	0.804	-0.002	0.922	-0.015	0.339
Income	0.001	0.977	-0.028	0.129	0.003	0.878
Political Interest	-0.010	0.578	-0.010	0.590	-0.010	0.550
Political Awareness	-0.004	0.755	-0.007	0.626	-0.015	0.237
Party ID	0.034	0.123	0.054	0.017	0.031	0.149
Ideology	0.025	0.141	0.024	0.171	0.042	0.013
Trait Authoritarianism	0.033	0.044	0.023	0.171	0.031	0.059

**Note:**  $T_{DIS}$  refers to the disgust treatment,  $T_{INFO}$  refers to the information treatment, and  $T_{INFODIS}$  refers to the information and disgust treatment. All variables are rescaled to range from 0 to 1.

Table A3. Exploratory factor analysis of emotional responses

Factor Analysis of Emotional Responses					
	Disgust	Aversion	Fear	Enthusiasm	Sadness
Disgusted	<b>0.740</b>				0.121
Grossed out	<b>0.873</b>				
Repulsed	<b>0.838</b>				
Angry		<b>0.498</b>			0.262
Bitter		<b>0.901</b>			
Resentful		<b>0.824</b>			
Anxious			<b>0.548</b>		0.238
Afraid			<b>0.927</b>		
Scared			<b>0.972</b>		
Proud				<b>0.700</b>	
Enthusiastic		0.101		<b>0.773</b>	
Hopeful		-0.159		<b>0.688</b>	0.119
Sad			0.323		<b>0.583</b>
<i>Cronbach's Alpha</i>	0.872	0.855	0.893	0.753	-

**Note:** Entries are factor loadings submitted to promax rotation. Factor loadings greater than 0.4 are shown in bold.



Table A4. The effects of treatments on emotions

	Emotions - Manipulation Check (1)					
	Disgust		Anxiety		Anger	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>						
ATE	0.126	0.114	-0.001	-0.009	0.035	0.019
(SE)	(0.017)	(0.018)	(0.017)	(0.018)	(0.016)	(0.018)
<i>RI p-value</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>0.953</i>	<i>0.628</i>	<i>0.033</i>	<i>0.304</i>
<u>Intercept</u>	0.292	0.348	0.540	0.523	0.334	0.435
(SE)	(0.009)	(0.040)	(0.010)	(0.039)	(0.009)	(0.037)
Covariates	No	Yes	No	Yes	No	Yes
N	1372	1154	1441	1199	1392	1168
<i>Treatment Group 2 : Information</i>						
ATE	0.022	0.011	0.039	0.042	0.042	0.032
(SE)	(0.016)	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)
<i>RI p-value</i>	<i>0.176</i>	<i>0.530</i>	<i>0.020</i>	<i>0.017</i>	<i>0.011</i>	<i>0.082</i>
<u>Intercept</u>	0.292	0.393	0.54	0.541	0.334	0.429
(SE)	(0.009)	(0.037)	(0.010)	(0.038)	(0.009)	(0.037)
Covariates	No	Yes	No	Yes	No	Yes
N	1356	1148	1422	1188	1378	1159
<i>Treatment Group 3 : Information x Disgust</i>						
ATE	0.151	0.144	0.003	0.0002	0.028	0.014
(SE)	(0.017)	(0.018)	(0.017)	(0.018)	(0.016)	(0.017)
<i>RI p-value</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>	<i>0.853</i>	<i>0.982</i>	<i>0.083</i>	<i>0.407</i>
<u>Intercept</u>	0.292	0.315	0.540	0.482	0.334	0.395
(SE)	(0.009)	(0.039)	(0.010)	(0.038)	(0.009)	(0.036)
Covariates	No	Yes	No	Yes	No	Yes
N	1367	1159	1440	1205	1392	1174

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HC1 robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table A5. The effects of treatments on emotions (continued)

	Emotions - Manipulation Check (2)			
	Enthusiasm		Sadness	
	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>				
ATE	-0.008	0.004	-0.008	-0.023
(SE)	(0.014)	(0.014)	(0.019)	(0.021)
<i>RI p-value</i>	<i>0.562</i>	<i>0.786</i>	<i>0.690</i>	<i>0.255</i>
Intercept	0.505	0.274	0.506	0.54
(SE)	(0.008)	(0.032)	(0.011)	(0.045)
Covariates	No	Yes	No	Yes
N	1365	1153	1450	1205
<i>Treatment Group 2 : Information</i>				
ATE	-0.038	-0.041	0.088	0.086
(SE)	(0.015)	(0.015)	(0.019)	(0.02)
<i>RI p-value</i>	<i>0.011</i>	<i>0.007</i>	<i>&lt;0.001</i>	<i>&lt;0.001</i>
Intercept	0.505	0.287	0.506	0.502
(SE)	(0.008)	(0.031)	(0.011)	(0.043)
Covariates	No	Yes	No	Yes
N	1356	1152	1435	1196
<i>Treatment Group 3 : Information x Disgust</i>				
ATE	-0.025	-0.009	0.019	0.019
(SE)	(0.014)	(0.014)	(0.019)	(0.02)
<i>RI p-value</i>	<i>0.083</i>	<i>0.492</i>	<i>0.308</i>	<i>0.336</i>
Intercept	0.505	0.292	0.506	0.483
(SE)	(0.008)	(0.031)	(0.011)	(0.043)
Covariates	No	Yes	No	Yes
N	1363	1160	1445	1207

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table A6. The effects of treatments on xenophobic and authoritarian attitudes

	Emotions - Manipulation Check (1)					
	Legal immigrants are a threat to the American way of life		Illegal immigrants are a threat to the American way of life.		Right Wing Authoritarianism	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Disgust</i>						
ATE	-0.004	0.013	-0.041	-0.002	-0.035	-0.015
(SE)	(0.016)	(0.017)	(0.021)	(0.019)	(0.012)	(0.010)
<i>RI p-value</i>	<i>0.823</i>	<i>0.418</i>	<i>0.043</i>	<i>0.912</i>	<i>0.002</i>	<i>0.128</i>
<u>Intercept</u>	0.219	0.102	0.509	0.034	0.539	0.221
(SE)	(0.009)	(0.034)	(0.012)	(0.040)	(0.007)	(0.022)
Covariates	No	Yes	No	Yes	No	Yes
N	1426	1193	1423	1188	1183	1023
<i>Treatment Group 2 : Information</i>						
ATE	-0.036	-0.018	-0.031	-0.008	-0.009	0.005
(SE)	(0.015)	(0.016)	(0.022)	(0.019)	(0.013)	(0.010)
<i>RI p-value</i>	<i>0.014</i>	<i>0.248</i>	<i>0.144</i>	<i>0.651</i>	<i>0.471</i>	<i>0.629</i>
<u>Intercept</u>	0.219	0.128	0.509	0.082	0.539	0.210
(SE)	(0.009)	(0.034)	(0.012)	(0.039)	(0.007)	(0.022)
Covariates	No	Yes	No	Yes	No	Yes
N	1409	1184	1410	1184	1166	1011
<i>Treatment Group 3 : Information x Disgust</i>						
ATE	-0.010	-0.001	-0.032	0.007	-0.017	-0.001
(SE)	(0.015)	(0.016)	(0.021)	(0.018)	(0.013)	(0.011)
<i>RI p-value</i>	<i>0.492</i>	<i>0.941</i>	<i>0.111</i>	<i>0.678</i>	<i>0.182</i>	<i>0.952</i>
<u>Intercept</u>	0.219	0.121	0.509	0.019	0.539	0.229
(SE)	(0.009)	(0.032)	(0.012)	(0.038)	(0.007)	(0.022)
Covariates	No	Yes	No	Yes	No	Yes
N	1430	1201	1432	1199	1171	1022

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The p-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

### Chapter 3

Table A1. Summary statistics of baseline covariates

	Mean Values of Baseline Covariates			
	Placebo	Conservative Christian Framing	Racial Justice Framing	Scientific Research Framing
Female	0.534 (0.499)	0.544 (0.498)	0.575 (0.494)	0.552 (0.497)
Age	0.589 (0.315)	0.578 (0.315)	0.611 (0.300)	0.610 (0.306)
White	0.742 (0.437)	0.717 (0.450)	0.737 (0.440)	0.729 (0.444)
Education	0.580 (0.300)	0.574 (0.290)	0.584 (0.301)	0.590 (0.296)
Income	0.420 (0.342)	0.417 (0.338)	0.428 (0.356)	0.428 (0.345)
Political Interest	0.639 (0.319)	0.634 (0.340)	0.656 (0.314)	0.650 (0.306)
Political Awareness	0.610 (0.246)	0.605 (0.250)	0.622 (0.240)	0.621 (0.240)
Party ID	0.467 (0.391)	0.467 (0.396)	0.486 (0.399)	0.472 (0.394)
Ideology	0.517 (0.296)	0.543 (0.291)	0.523 (0.299)	0.497 (0.299)
Trait Authoritarianism	0.601 (0.182)	0.591 (0.173)	0.588 (0.176)	0.576 (0.156)

*Note:* Entries are mean values of baseline covariates and the respective standard deviations in parentheses. All variables are rescaled to range from 0 to 1.

Table A2. Table of balance test

	Balance on Baseline Covariates					
	T <sub>CONS</sub> – Placebo		T <sub>RACE</sub> – Placebo		T <sub>SCIENCE</sub> – Placebo	
	Difference	<i>p-value</i>	Difference	<i>p-value</i>	Difference	<i>p-value</i>
Female	-0.010	0.715	-0.040	0.136	-0.017	0.514
Age	0.011	0.510	-0.022	0.186	-0.020	0.236
White	0.024	0.328	0.004	0.842	0.012	0.621
Education	0.005	0.735	-0.003	0.817	-0.010	0.524
Income	0.003	0.860	-0.008	0.683	-0.007	0.686
Political Interest	0.005	0.781	-0.016	0.353	-0.010	0.531
Political Awareness	0.004	0.728	-0.011	0.378	-0.010	0.439
Party ID	-0.0003	0.987	-0.019	0.391	-0.004	0.834
Ideology	-0.025	0.125	-0.005	0.747	0.020	0.231
Trait Authoritarianism	0.009	0.341	0.012	0.208	0.023	0.009

**Note:**  $T_{CONS}$  refers to the treatment that frames climate change as a conservative Christian issue,  $T_{RACE}$  refers to the treatment that frames climate change as a racial justice issue, and  $T_{SCIENCE}$  refers to the treatment that provides scientific evidence about climate change. All variables are rescaled to range from 0 to 1.

Table A3. Exploratory factor analysis of preferences for environmental policies

	Factor Analysis of Preferences for Environmental Policies	
	Short-term Policies	Long-term Policies
Tax breaks to companies		<b>0.722</b>
Pollution tax to companies	0.136	<b>0.620</b>
Fund green research		<b>0.873</b>
Financial relief to victims	<b>0.826</b>	
Free housing to victims	<b>0.891</b>	
Free healthcare to victims	<b>0.831</b>	
<i>Cronbach's Alpha</i>	<i>0.900</i>	<i>0.805</i>

**Note:** Entries are factor loadings submitted to promax rotation. Factor loadings greater than 0.4 are shown in bold.

## Chapter 4

Table A1. Summary statistics of baseline covariates

	Mean values of Baseline Covariates		
	Placebo	Hurricane Harvey	9/11 Attacks
Female	0.611 (0.487)	0.610 (0.488)	0.594 (0.491)
Age	0.561 (0.312)	0.579 (0.308)	0.569 (0.305)
White	0.712 (0.452)	0.708 (0.455)	0.730 (0.444)
Education	0.535 (0.296)	0.549 (0.301)	0.543 (0.306)
Income	0.398 (0.329)	0.390 (0.334)	0.368 (0.330)
Political Interest	0.592 (0.330)	0.569 (0.342)	0.561 (0.342)
Political Awareness	0.568 (0.245)	0.561 (0.258)	0.554 (0.262)
Party ID	0.468 (0.382)	0.472 (0.386)	0.494 (0.398)
Ideology	0.509 (0.294)	0.526 (0.288)	0.514 (0.292)
Trait Authoritarianism	0.561 (0.314)	0.577 (0.314)	0.563 (0.307)

*Note:* Entries are mean values of baseline covariates and the respective standard deviations in parentheses. All variables are rescaled to range from 0 to 1.

Table A2. Table of balance test

	Balance on Baseline Covariates			
	$T_{HH} - \text{Placebo}$		$T_{911} - \text{Placebo}$	
	Difference	<i>p-value</i>	Difference	<i>p-value</i>
Female	0.0003	0.991	0.016	0.550
Age	-0.018	0.309	-0.007	0.662
White	0.004	0.859	-0.017	0.499
Education	-0.013	0.441	-0.007	0.659
Income	0.007	0.686	0.030	0.122
Political Interest	0.022	0.249	0.030	0.116
Political Awareness	0.006	0.645	0.014	0.344
Party ID	-0.003	0.867	-0.026	0.269
Ideology	-0.017	0.330	-0.005	0.766
Trait Authoritarianism	-0.015	0.389	-0.002	0.898

**Note:**  $T_{HH}$  refers to the treatment that primes subjects with memories of Hurricane Harvey and  $T_{911}$  refers to the treatment that primes subjects with memories of the 9/11 terrorist attacks. All variables are rescaled to range from 0 to 1.



Table A3. Exploratory factor analysis of preferences for environmental policies

	Factor Analysis of Preferences for Environmental Policies	
	Short-term Policies	Long-term Policies
Tax breaks to companies		<b>0.652</b>
Pollution tax to companies	0.215	<b>0.566</b>
Fund green research	-0.106	<b>0.997</b>
Financial relief to victims	<b>0.781</b>	
Free housing to victims	<b>0.921</b>	
Free healthcare to victims	<b>0.824</b>	
<i>Cronbach's Alpha</i>	0.887	0.806

**Note:** Entries are factor loadings submitted to promax rotation. Factor loadings greater than 0.3 are shown in bold.

Table A4. Exploratory factor analysis of preferences for counter-terrorism policies

	Factor Analysis of Preferences for Counter-terrorism Policies	
	Confrontational Policies	Defensive Policies
Shut down the borders	0.233	<b>0.571</b>
Deport Immigrants	-0.134	<b>0.986</b>
Deport Muslims		<b>0.779</b>
Launch a drone strike in Iran	<b>0.949</b>	-0.149
Expand war on terrorism	<b>0.771</b>	
Deploy troops in U.S. cities	<b>0.412</b>	0.385
Torture suspected terrorists	<b>0.484</b>	0.259
Censor social media	<b>0.373</b>	0.256
<i>Cronbach's Alpha</i>	0.838	0.833

*Note:* Entries are factor loadings submitted to promax rotation. Factor loadings greater than 0.3 are shown in bold.

## Appendix B: Heterogeneous effects

### Chapter 1

Table B1. The heterogeneous effects of the presidential address on preferences for counter-terrorism policies

	Heterogeneous Effects of Exposure to the Presidential Address across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	p-value	F-value	p-value	F-value	p-value	F-value	p-value
Shut down the borders	2.128	0.144	0.829	0.362	0.383	0.536	1.996	0.158
Deport Immigrants	1.627	0.202	1.148	0.284	0.487	0.485	2.471	0.116
Deport Muslims	0.016	0.898	0.465	0.495	1.448	0.229	1.129	0.288
Launch a drone strike	1.521	0.217	2.084	0.149	0.170	0.679	3.389	0.065
Expand war on terrorism	0.122	0.726	0.539	0.462	0.029	0.863	<b>4.523</b>	0.033
Deploy troops in U.S. cities	0.149	0.698	1.039	0.308	1.355	0.244	<b>13.64</b>	<0.001
Torture suspected terror.	0.033	0.854	0.412	0.521	0.478	0.489	3.148	0.076
Censor social media	0.260	0.609	<b>8.457</b>	0.003	<b>4.703</b>	0.030	2.036	0.153
Liberties vs. Security	0.455	0.499	3.621	0.057	<b>4.317</b>	0.038	0.281	0.595
Counter-terr. Policies (sc.)	0.831	0.362	0.002	0.962	1.095	0.295	<b>11.453</b>	<0.001
Defensive Policies (sc.)	0.979	0.322	0.0004	0.984	0.022	0.879	2.836	0.092
Confront. Policies (sc.)	0.093	0.759	0.036	0.849	1.361	0.243	<b>14.428</b>	<0.001

**Note:** Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B2. The heterogeneous effects of Democratic support for the presidential address on preferences for counter-terrorism policies

	Heterogeneous Effects of Exposure to Democratic Support for the Presidential Address across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Shut down the borders	0.046	0.828	0.160	0.688	1.016	0.313	0.486	0.485
Deport Immigrants	0.729	0.393	0.062	0.803	3.756	0.052	1.525	0.217
Deport Muslims	0.132	0.716	0.0001	0.992	<b>3.999</b>	0.045	2.239	0.134
Launch a drone strike	0.832	0.361	<b>5.509</b>	0.019	<b>7.449</b>	0.006	<b>5.321</b>	0.021
Expand war on terrorism	0.028	0.866	1.557	0.212	<b>8.503</b>	0.003	3.516	0.061
Deploy troops in U.S. cities	0.908	0.340	1.432	0.231	0.282	0.595	<b>5.121</b>	0.023
Torture suspected terror.	0.058	0.808	0.050	0.822	<b>5.441</b>	0.019	<b>4.155</b>	0.041
Censor social media	0.645	0.421	0.643	0.422	0.392	0.531	0.173	0.677
Liberties vs. Security	0.203	0.652	2.775	0.096	<b>13.255</b>	<0.001	0.091	0.763
Counter-terr. Policies (sc.)	0.308	0.579	0.101	0.749	<b>5.620</b>	0.017	<b>6.382</b>	0.011
Defensive Policies (sc.)	0.097	0.755	0.001	0.970	3.346	0.067	1.982	0.159
Confront. Policies (sc.)	0.016	0.898	0.367	0.544	<b>6.427</b>	0.011	<b>7.492</b>	0.006

*Note:* Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B3. The heterogeneous effects of Democratic opposition to the presidential address on preferences for counter-terrorism policies

	Heterogeneous Effects of Exposure to Democratic Opposition to the Presidential Address across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Shut down the borders	1.390	0.238	0.001	0.969	<b>4.795</b>	0.028	0.052	0.818
Deport Immigrants	0.372	0.541	0.190	0.662	1.379	0.240	0.492	0.483
Deport Muslims	1.175	0.278	<b>3.900</b>	0.048	0.07	0.791	0.791	0.373
Launch a drone strike	0.082	0.774	<b>5.007</b>	0.025	3.761	0.052	3.813	0.051
Expand war on terrorism	0.941	0.332	0.112	0.737	1.614	0.204	2.021	0.155
Deploy troops in U.S. cities	2.486	0.115	1.982	0.159	0.371	0.542	0.200	0.654
Torture suspected terror.	0.027	0.867	3.619	0.057	<b>16.116</b>	<0.001	0.404	0.525
Censor social media	0.001	0.971	3.471	0.062	0.152	0.696	1.739	0.187
Liberties vs. Security	0.14	0.708	3.681	0.055	<b>10.896</b>	<0.001	0.0001	0.992
Counter-terr. Policies (sc.)	0.921	0.337	0.071	0.789	2.79	0.095	0.658	0.417
Defensive Policies (sc.)	1.165	0.280	0.580	0.446	2.303	0.129	0.258	0.611
Confront. Policies (sc.)	0.661	0.416	0.326	0.567	3.268	0.070	1.754	0.185

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

## Chapter 2

Table B1. The heterogeneous effects of disgust on pandemic-related attitudes

	Heterogeneous Effects of Disgust across levels of : (1)							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>
Force medical exams	1.271	<i>0.305</i>	0.0001	<i>0.996</i>	0.026	<i>0.375</i>	0.020	<i>0.897</i>
Quarantine people	0.344	<i>0.590</i>	0.026	<i>0.878</i>	0.571	<i>0.532</i>	0.558	<i>0.494</i>
Isolate patients	0.686	<i>0.445</i>	0.571	<i>0.494</i>	0.004	<i>0.877</i>	0.138	<i>0.727</i>
Force hospitals to cure patients	2.744	<i>0.150</i>	0.004	<i>0.955</i>	2.400	<i>0.152</i>	0.255	<i>0.642</i>
Destroy personal belongings	0.0003	<i>0.990</i>	0.049	<i>0.846</i>	0.257	<i>0.637</i>	0.732	<i>0.431</i>
Wash hands	0.275	<i>0.623</i>	1.257	<i>0.259</i>	1.940	<i>0.172</i>	0.924	<i>0.345</i>
Cover your mouth	2.065	<i>0.195</i>	0.553	<i>0.476</i>	0.314	<i>0.567</i>	0.865	<i>0.388</i>
Cough into elbow	0.149	<i>0.716</i>	0.017	<i>0.895</i>	0.555	<i>0.466</i>	0.024	<i>0.885</i>
Wear a mask	0.006	<i>0.938</i>	0.084	<i>0.791</i>	0.360	<i>0.577</i>	0.019	<i>0.889</i>
Quarantine Asian people	0.978	<i>0.359</i>	0.006	<i>0.943</i>	0.063	<i>0.826</i>	1.615	<i>0.217</i>
Avoid contact with Asians	2.549	<i>0.148</i>	0.368	<i>0.577</i>	0.019	<i>0.897</i>	0.233	<i>0.653</i>
Avoid visiting areas w/ Asians	-0.003	<i>0.954</i>	0.536	<i>0.502</i>	0.941	<i>0.380</i>	0.622	<i>0.446</i>
Avoid eating Asian food	1.401	<i>0.276</i>	0.761	<i>0.423</i>	0.005	<i>0.951</i>	0.025	<i>0.886</i>

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test using randomization inference. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B2. The heterogeneous effects of disgust on policy preferences and emotional responses

	Heterogeneous Effects of Disgust across levels of : (2)							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>
Gay marriage	0.854	0.356	0.847	0.389	0.356	0.575	0.064	0.808
Gun control	1.816	0.208	0.219	0.660	2.119	0.173	0.103	0.759
Increase taxes for the rich	0.954	0.361	0.507	0.504	3.697	0.072	-0.0001	0.968
Universal healthcare program	<b>10.442</b>	0.002	3.593	0.075	<b>5.445</b>	0.028	0.821	0.393
Death penalty	1.437	0.262	0.453	0.529	0.557	0.485	3.365	0.086
Abortion rights	0.988	0.353	0.705	0.433	1.482	0.256	0.884	0.379
Deport immigrants	0.251	0.639	0.869	0.383	0.066	0.809	0.078	0.791
Shut down the borders	0.003	0.959	<b>4.829</b>	0.039	0.286	0.609	1.485	0.253
Disgust	0.175	0.695	0.104	0.763	0.236	0.649	0.013	0.911
Anxiety	0.079	0.768	0.158	0.687	0.324	0.568	0.059	0.814
Anger	0.377	0.546	0.016	0.895	0.345	0.561	0.042	0.826
Enthusiasm	0.258	0.634	0.199	0.674	0.16	0.704	0.789	0.406
Sadness	0.491	0.512	0.071	0.804	0.675	0.442	0.003	0.961

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test using randomization inference. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B3. The heterogeneous effects of exposure to information on pandemic-related attitudes

	Heterogeneous Effects of Exposure to Information across levels of : (1)							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>	F-value	<i>RI p-value</i>
Force medical exams	0.056	<i>0.836</i>	1.841	<i>0.230</i>	1.244	<i>0.308</i>	0.673	<i>0.462</i>
Quarantine people	0.917	<i>0.379</i>	0.192	<i>0.704</i>	0.277	<i>0.621</i>	1.308	<i>0.300</i>
Isolate patients	0.684	<i>0.457</i>	0.426	<i>0.544</i>	0.509	<i>0.506</i>	2.338	<i>0.148</i>
Force hospitals to cure patients	0.109	<i>0.776</i>	0.156	<i>0.721</i>	2.297	<i>0.153</i>	0.659	<i>0.459</i>
Destroy personal belongings	1.419	<i>0.287</i>	0.289	<i>0.627</i>	0.661	<i>0.459</i>	0.633	<i>0.458</i>
Wash hands	0.028	<i>0.881</i>	0.001	<i>0.983</i>	0.239	<i>0.624</i>	0.034	<i>0.849</i>
Cover your mouth	0.021	<i>0.889</i>	0.035	<i>0.870</i>	0.485	<i>0.495</i>	0.231	<i>0.659</i>
Cough into elbow	0.083	<i>0.791</i>	4.497	<i>0.057</i>	1.103	<i>0.321</i>	0.03	<i>0.873</i>
Wear a mask	0.045	<i>0.852</i>	0.051	<i>0.840</i>	0.026	<i>0.883</i>	1.159	<i>0.301</i>
Quarantine Asian people	3.654	<i>0.087</i>	0.119	<i>0.744</i>	0.005	<i>0.945</i>	0.019	<i>0.888</i>
Avoid contact with Asians	0.072	<i>0.805</i>	-0.0004	<i>0.990</i>	2.395	<i>0.164</i>	0.073	<i>0.791</i>
Avoid visiting areas w/ Asians	0.481	<i>0.533</i>	0.068	<i>0.812</i>	0.219	<i>0.672</i>	0.024	<i>0.879</i>
Avoid eating Asian food	0.009	<i>0.929</i>	0.001	<i>0.972</i>	0.912	<i>0.394</i>	1.585	<i>0.236</i>

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test using randomization inference. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.



Table B4. The heterogeneous effects of exposure to information on policy preferences and emotional responses

	Heterogeneous Effects of Exposure to Information across levels of : (2)							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	RI <i>p-value</i>	F-value	RI <i>p-value</i>	F-value	RI <i>p-value</i>	F-value	RI <i>p-value</i>
Gay marriage	0.004	0.934	1.100	0.327	0.421	0.544	1.61	0.236
Gun control	<b>7.915</b>	0.006	2.684	0.127	0.348	0.576	0.800	0.404
Increase taxes for the rich	0.121	0.745	0.594	0.472	1.831	0.207	0.002	0.966
Universal healthcare program	3.359	0.087	2.098	0.177	<b>4.494</b>	0.042	2.232	0.163
Death penalty	3.344	0.086	0.708	0.424	1.143	0.316	0.711	0.427
Abortion rights	0.012	0.918	0.017	0.903	0.338	0.587	0.246	0.641
Deport immigrants	0	0.995	0	0.999	1.125	0.322	3.492	0.081
Shut down the borders	0.297	0.611	0.368	0.571	0.195	0.680	1.679	0.226
Disgust	0.600	0.469	2.637	0.130	2.011	0.186	1.335	0.281
Anxiety	2.109	0.154	0.598	0.472	0.002	0.961	0.047	0.838
Anger	0.069	0.787	1.279	0.283	0.828	0.397	0.059	0.790
Enthusiasm	1.252	0.294	0.083	0.786	1.206	0.303	0.106	0.759
Sadness	0.012	0.913	0.124	0.724	0.038	0.843	0.205	0.650

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test using randomization inference. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B5. The heterogeneous effects of exposure to information and disgust on pandemic-related attitudes

	Heterogeneous Effects of Exposure to Information x Disgust across levels of : (1)							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	RI <i>p</i> -value	F-value	RI <i>p</i> -value	F-value	RI <i>p</i> -value	F-value	RI <i>p</i> -value
Force medical exams	1.707	0.236	0.180	0.703	0.914	0.382	4.584	0.051
Quarantine people	0.421	0.560	0.886	0.397	1.155	0.310	0.545	0.496
Isolate patients	0.012	0.911	0.173	0.709	3.421	0.083	0.417	0.542
Force hospitals to cure patients	3.097	0.115	0.155	0.715	0.054	0.824	0.098	0.770
Destroy personal belongings	0.211	0.681	0.05	0.836	1.941	0.197	0.034	0.865
Wash hands	4.315	0.066	-0.001	0.980	2.141	0.156	0.104	0.746
Cover your mouth	0.799	0.799	0.656	0.435	0.307	0.572	0.208	0.678
Cough into elbow	0.322	0.608	0.066	0.806	1.013	0.359	0.645	0.447
Wear a mask	0.101	0.779	0.012	0.922	0.577	0.479	0.442	0.530
Quarantine Asian people	4.398	0.055	0.014	0.908	0.476	0.542	1.454	0.245
Avoid contact with Asians	4.101	0.067	0.679	0.442	0.167	0.719	0.183	0.676
Avoid visiting areas w/ Asians	1.609	0.254	3.3	0.087	0.098	0.775	0.029	0.863
Avoid eating Asian food	4.849	0.042	0.771	0.402	0.573	0.497	<b>4.719</b>	0.040

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test using randomization inference. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B6. The heterogeneous effects of exposure to information and disgust on policy preferences and emotional responses

	Heterogeneous Effects of Exposure to Information x Disgust across levels of : (2)							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	RI p-value	F-value	RI p-value	F-value	RI p-value	F-value	RI p-value
Gay marriage	0.319	0.597	0.053	0.825	0.003	0.947	2.788	0.117
Gun control	0.882	0.376	1.528	0.245	0.774	0.408	<b>8.307</b>	0.005
Increase taxes for the rich	0.469	0.519	<b>4.176</b>	0.047	<b>5.436</b>	0.028	0.306	0.602
Universal healthcare program	<b>5.868</b>	0.023	0.203	0.671	0.487	0.511	0.011	0.912
Death penalty	0.997	0.348	0.028	0.875	0.065	0.810	0.0001	0.994
Abortion rights	1.248	0.297	1.809	0.209	2.268	0.159	2.278	0.159
Deport immigrants	0	0.987	1.228	0.300	0.022	0.886	<b>4.882</b>	0.039
Shut down the borders	0.195	0.462	0.613	0.462	0.106	0.759	2.396	0.147
Disgust	0.005	0.946	2.088	0.175	<b>7.907</b>	0.007	0.001	0.953
Anxiety	0.016	0.896	1.283	0.288	<b>4.983</b>	0.036	0.128	0.736
Anger	1.298	0.255	<b>7.494</b>	0.009	<b>6.744</b>	0.013	0.115	0.731
Enthusiasm	0.013	0.911	-0.001	0.998	0.026	0.879	1.026	0.341
Sadness	0.013	0.912	0.074	0.798	0.614	0.463	0.251	0.638

**Note:** Entries are F-values. The p-values are based on a two-tailed test using randomization inference. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

### Chapter 3

Table B1. The heterogeneous effects of conservative Christian framing on preferences for environmental policies

	Heterogeneous Effects of Exposure to Conservative Christian Framing across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Global warming is a serious problem	0.109	<i>0.741</i>	3.149	<i>0.076</i>	0.753	<i>0.385</i>	0.004	<i>0.948</i>
Concerned that hurricane-related deaths will increase	0.101	<i>0.749</i>	0.123	<i>0.725</i>	0.324	<i>0.569</i>	1.013	<i>0.314</i>
Economy vs. Environment	0.005	<i>0.941</i>	0.042	<i>0.836</i>	0.246	<i>0.619</i>	0.129	<i>0.719</i>
Long-term vs. short-term environmental policies	0.849	<i>0.356</i>	0.006	<i>0.937</i>	0.271	<i>0.602</i>	1.320	<i>0.250</i>
Tax breaks to companies	2.946	<i>0.086</i>	1.002	<i>0.317</i>	0.208	<i>0.648</i>	3.286	<i>0.070</i>
Pollution tax to companies	0.0002	<i>0.990</i>	0.001	<i>0.970</i>	0.484	<i>0.486</i>	0.156	<i>0.692</i>
Fund more green research	0.237	<i>0.626</i>	0.267	<i>0.605</i>	1.745	<i>0.186</i>	0.019	<i>0.889</i>
Financial relief to victims	0.674	<i>0.411</i>	1.144	<i>0.284</i>	1.696	<i>0.192</i>	0.026	<i>0.871</i>
Free housing to victims	0.411	<i>0.521</i>	2.973	<i>0.084</i>	1.122	<i>0.289</i>	0.690	<i>0.406</i>
Free healthcare to victims	0.878	<i>0.348</i>	0.752	<i>0.385</i>	0.612	<i>0.433</i>	0.455	<i>0.499</i>
Long-term Environmental Policies (scale)	0.528	<i>0.467</i>	0.327	<i>0.567</i>	1.332	<i>0.248</i>	0.658	<i>0.417</i>
Short-term Relief Measures (scale)	0.654	<i>0.418</i>	1.998	<i>0.157</i>	1.557	<i>0.212</i>	0.004	<i>0.945</i>
Environmental Policies (scale)	0.098	<i>0.753</i>	0.996	<i>0.318</i>	1.711	<i>0.191</i>	0.174	<i>0.676</i>

**Note:** Entries are F-values. The *p*-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B2. The heterogeneous effects of racial justice framing on preferences for environmental policies

	Heterogeneous Effects of Exposure to Racial Justice Framing across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Global warming is a serious problem	1.290	0.256	0.811	0.368	0.382	0.536	2.366	0.124
Concerned that hurricane-related deaths will increase	0.132	0.715	<b>4.060</b>	0.044	1.203	0.272	<b>4.919</b>	0.026
Economy vs. Environment	0.752	0.386	0.036	0.848	0.455	0.499	<b>3.856</b>	0.049
Long-term vs. short-term environmental policies	0.189	0.663	1.344	0.246	0.123	0.725	2.502	0.113
Tax breaks to companies	1.513	0.218	0.032	0.856	0.609	0.435	0.497	0.480
Pollution tax to companies	2.114	0.146	0.411	0.521	1.074	0.300	1.534	0.215
Fund more green research	0.237	0.626	0.034	0.853	0.010	0.918	1.250	0.263
Financial relief to victims	3.470	0.062	3.029	0.081	0.134	0.713	0.041	0.838
Free housing to victims	0.040	0.840	0.695	0.404	1.030	0.310	2.860	0.091
Free healthcare to victims	0.036	0.847	0.162	0.687	0.089	0.765	1.022	0.312
Long-term Environmental Policies (scale)	1.209	0.271	0.093	0.759	0.726	0.394	0.760	0.383
Short-term Relief Measures (scale)	0.259	0.610	1.060	0.303	0.099	0.752	0.987	0.320
Environmental Policies (scale)	0.234	0.628	0.359	0.548	0.186	0.666	0.827	0.363

**Note:** Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B3. The heterogeneous effects of scientific research framing on preferences for environmental policies

	Heterogeneous Effects of Exposure to Scientific Research Framing across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Global warming is a serious problem	0.126	<i>0.721</i>	<b>6.117</b>	<i>0.013</i>	<b>10.679</b>	<i>0.001</i>	0.091	<i>0.762</i>
Concerned that hurricane-related deaths will increase	0.029	<i>0.864</i>	1.410	<i>0.235</i>	0.887	<i>0.346</i>	0.728	<i>0.393</i>
Economy vs. Environment	0.082	<i>0.773</i>	0.105	<i>0.745</i>	0.435	<i>0.509</i>	0.390	<i>0.531</i>
Long-term vs. short-term environmental policies	0.164	<i>0.684</i>	0.033	<i>0.855</i>	0.592	<i>0.441</i>	0.283	<i>0.594</i>
Tax breaks to companies	0.832	<i>0.361</i>	0.634	<i>0.426</i>	1.609	<i>0.204</i>	0.089	<i>0.764</i>
Pollution tax to companies	0.381	<i>0.537</i>	0.855	<i>0.355</i>	<b>6.837</b>	<i>0.009</i>	0.808	<i>0.368</i>
Fund more green research	0.016	<i>0.898</i>	2.425	<i>0.119</i>	<b>8.565</b>	<i>0.003</i>	1.158	<i>0.282</i>
Financial relief to victims	0.019	<i>0.890</i>	<b>7.481</b>	<i>0.006</i>	<b>14.618</b>	<i>&lt;0.001</i>	2.486	<i>0.115</i>
Free housing to victims	0.079	<i>0.777</i>	0.896	<i>0.343</i>	2.225	<i>0.136</i>	0.672	<i>0.412</i>
Free healthcare to victims	0.390	<i>0.532</i>	1.730	<i>0.188</i>	3.186	<i>0.074</i>	1.262	<i>0.261</i>
Long-term Environmental Policies (scale)	0.729	<i>0.393</i>	1.347	<i>0.246</i>	<b>7.209</b>	<i>0.007</i>	0.044	<i>0.833</i>
Short-term Relief Measures (scale)	0.067	<i>0.795</i>	2.739	<i>0.098</i>	<b>6.808</b>	<i>0.009</i>	2.192	<i>0.139</i>
Environmental Policies (scale)	0.116	<i>0.733</i>	2.649	<i>0.103</i>	<b>8.904</b>	<i>0.002</i>	0.886	<i>0.346</i>

**Note:** Entries are F-values. The *p*-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B4. The heterogeneous effects of treatments on preferences for environmental policies

	Heterogeneous Effects of Treatments across educational levels					
	Conservative Christian Framing		Racial Justice Framing		Scientific Research Framing	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Global warming is a serious problem	1.361	0.243	0.094	0.758	0.005	0.939
Concerned that hurricane-related deaths will increase	1.108	0.292	0.038	0.843	0.088	0.765
Economy vs. Environment	0.506	0.476	0.416	0.518	0.508	0.475
Long-term vs. short-term environmental policies	0.912	0.339	0.020	0.885	0.045	0.830
Tax breaks to companies	0.111	0.739	0.650	0.420	1.608	0.204
Pollution tax to companies	0.053	0.816	0.415	0.519	0.191	0.662
Fund more green research	0.206	0.649	0.006	0.938	0.001	0.979
Financial relief to victims	<b>5.514</b>	<b>0.019</b>	1.384	0.239	0.122	0.726
Free housing to victims	1.881	0.170	0.049	0.823	0.149	0.698
Free healthcare to victims	<b>6.136</b>	<b>0.013</b>	0.004	0.947	0.306	0.580
Long-term Environmental Policies (scale)	0.328	0.566	0.131	0.716	0.683	0.408
Short-term Relief Measures (scale)	<b>4.953</b>	<b>0.026</b>	0.018	0.891	0.006	0.937
Environmental Policies (scale)	1.762	0.184	0.135	0.713	0.294	0.587

*Note:* Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

## Chapter 4

Table B1. The heterogeneous effects of memories of Hurricane Harvey on preferences for environmental policies

	Heterogeneous Effects of memories of Hurricane Harvey across levels of :							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Global warming is a serious problem	0.0001	0.976	0.345	0.556	0.009	0.922	1.496	0.221
Concerned that hurricane-related deaths will increase	0.688	0.406	0.215	0.642	0.101	0.750	0.096	0.755
Economy vs. Environment	0.002	0.964	0.006	0.933	0.007	0.930	0.421	0.516
Long- vs. short-term policies	0.125	0.723	0.404	0.524	0.001	0.966	0.0002	0.988
Tax breaks to companies	<b>4.029</b>	<b>0.044</b>	1.312	0.252	0.133	0.714	0.012	0.910
Pollution tax to companies	0.232	0.629	0.002	0.959	0.011	0.916	0.153	0.695
Fund more green research	0.236	0.626	0.776	0.378	0.547	0.459	0.256	0.612
Financial relief to victims	2.694	0.101	0.166	0.683	0.004	0.944	0.0002	0.989
Free housing to victims	0.255	0.613	0.579	0.446	0.010	0.919	0.837	0.360
Free healthcare to victims	0.030	0.861	0.346	0.556	0.001	0.976	0.045	0.831
Long-term policies (scale)	1.573	0.210	0.695	0.404	0.220	0.639	0.094	0.758
Short-term policies (scale)	0.446	0.504	0.462	0.496	0.001	0.974	0.103	0.748
Environmental policies (scale)	1.574	0.209	0.977	0.323	0.172	0.678	0.105	0.745

**Note:** Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.



Table B2. The heterogeneous effects of memories of the 9/11 terrorist attacks on preferences for counter-terrorism policies

	Heterogeneous Effects of memories of the 9/11 terrorist attacks across levels of :							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Concerned about terror.	2.198	<i>0.138</i>	0.019	<i>0.888</i>	0.018	<i>0.893</i>	0.950	<i>0.329</i>
Shut down the borders	0.218	<i>0.640</i>	0.076	<i>0.782</i>	0.018	<i>0.891</i>	0.204	<i>0.651</i>
Deport Immigrants	0.004	<i>0.946</i>	0.002	<i>0.960</i>	0.318	<i>0.572</i>	0.481	<i>0.487</i>
Deport Muslims	0.037	<i>0.847</i>	0.379	<i>0.538</i>	0.089	<i>0.765</i>	2.297	<i>0.129</i>
Launch a drone strike	<b>5.858</b>	<b>0.015</b>	1.184	<i>0.276</i>	1.479	<i>0.224</i>	0.405	<i>0.524</i>
Expand war on terrorism	2.954	<i>0.085</i>	1.757	<i>0.185</i>	0.848	<i>0.357</i>	0.023	<i>0.877</i>
Deploy troops in U.S. cities	<b>6.616</b>	<b>0.010</b>	0.005	<i>0.940</i>	0.004	<i>0.944</i>	1.571	<i>0.210</i>
Torture suspected terror.	<b>4.873</b>	<b>0.027</b>	2.615	<i>0.106</i>	3.458	<i>0.063</i>	0.063	<i>0.800</i>
Censor social media	1.033	<i>0.309</i>	0.781	<i>0.376</i>	0.030	<i>0.861</i>	0.489	<i>0.484</i>
Defensive policies (sc.)	0.019	<i>0.890</i>	0.174	<i>0.676</i>	0.195	<i>0.658</i>	1.348	<i>0.245</i>
Confront. policies (sc.)	<b>8.749</b>	<b>0.003</b>	1.115	<i>0.291</i>	1.325	<i>0.250</i>	0.656	<i>0.418</i>
Counter-terr. Policies (sc.)	3.364	<i>0.067</i>	0.230	<i>0.631</i>	0.509	<i>0.475</i>	1.067	<i>0.301</i>

**Note:** Entries are *F-values*. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B3. Heterogeneous treatment effects across age on preferences for environmental policies

	Heterogeneous Treatment Effects across Age (1)			
	Hurricane Harvey		9/11 Attacks	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Global warming is a serious problem	0.313	<i>0.575</i>	0.027	<i>0.867</i>
Concerned that hurricane-related deaths will increase	1.039	<i>0.308</i>	2.299	<i>0.129</i>
Economy vs. Environment	0.051	<i>0.821</i>	1.649	<i>0.199</i>
Long vs. short-term policies	1.316	<i>0.251</i>	0.003	<i>0.955</i>
Tax breaks to companies	0.197	<i>0.656</i>	2.054	<i>0.152</i>
Pollution tax to companies	0.039	<i>0.842</i>	0.170	<i>0.679</i>
Fund more green research	1.574	<i>0.209</i>	0.090	<i>0.764</i>
Financial relief to victims	0.992	<i>0.319</i>	1.043	<i>0.307</i>
Free housing to victims	2.706	<i>0.100</i>	2.420	<i>0.120</i>
Free healthcare to victims	1.907	<i>0.167</i>	2.410	<i>0.120</i>
Long-term policies (scale)	0.294	<i>0.587</i>	0.944	<i>0.331</i>
Short-term policies (scale)	2.671	<i>0.102</i>	2.946	<i>0.086</i>
Environmental policies (sc.)	0.520	<i>0.471</i>	2.725	<i>0.099</i>

**Note:** Entries are *F-values*. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table B4. Heterogeneous treatment effects across age on preferences for counter-terrorism policies

	Heterogeneous Treatment Effects across Age (2)			
	9/11 Attacks		Hurricane Harvey	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Concerned about terror.	0.068	<i>0.793</i>	0.720	<i>0.396</i>
Shut down the borders	0.460	<i>0.497</i>	0.125	<i>0.723</i>
Deport Immigrants	0.016	<i>0.897</i>	0.570	<i>0.450</i>
Deport Muslims	0.002	<i>0.962</i>	0.052	<i>0.818</i>
Launch a drone strike	0.068	<i>0.794</i>	1.311	<i>0.252</i>
Expand war on terrorism	0.0004	<i>0.984</i>	0.219	<i>0.639</i>
Deploy troops in U.S. cities	0.272	<i>0.601</i>	0.523	<i>0.469</i>
Torture suspected terrorist	3.131	<i>0.077</i>	0.116	<i>0.733</i>
Censor social media	0.143	<i>0.704</i>	0.002	<i>0.958</i>
Defensive policies (sc.)	0.415	<i>0.519</i>	0.210	<i>0.646</i>
Confront. policies (sc.)	1.021	<i>0.312</i>	0.126	<i>0.721</i>
Counter-terr. Policies (sc.)	0.711	<i>0.399</i>	0.548	<i>0.459</i>

**Note:** Entries are F-values. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

## **Appendix C: Downstream effects and Alternative mechanisms**

### ***Chapter 1***

In this section, I summarize the results from a series of tests that explore downstream effects on policy preferences irrelevant to terrorism and the possibility of treatment effects being mediated by national attachment or right-wing authoritarian preferences.

It is often speculated that terrorist threats trigger a conservative shift in policy preferences. Tables C1-C5 present disconfirming evidence. The outcomes of these tests include support for gay marriage, gun control, increasing the taxes for the rich, universal healthcare, death penalty, and abortion rights. Attitudes toward policies that are not related to counter-terrorism remain largely unaffected both on average and across degrees of political awareness, ideology, partisan identity, and trait authoritarianism.

On the other hand, I tested whether this conservative shift manifests itself into an increase in national attachment or right-wing authoritarian preferences, which could mediate the treatment effects on attitudes toward counter-terrorism. The results of the tests suggest that the treatments did not impact national attachment or right-wing authoritarianism (see Tables C6-C7), and hence neither of them mediates treatment effects on preferences for counter-terrorism policies.

Table C1. The direct effects of treatments on preferences for policies

	Policy Preferences (1)					
	Gay marriage		Gun control		Increase taxes for the rich	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Presidential Address</i>						
ATE	-0.033	-0.029	0.028	0.023	-0.015	-0.009
(SE)	(0.022)	(0.020)	(0.022)	(0.020)	(0.019)	(0.019)
<i>p</i> -value	0.139	0.160	0.194	0.261	0.428	0.638
Intercept	0.690	0.952	0.626	0.770	0.705	0.884
(SE)	(0.012)	(0.044)	(0.012)	(0.043)	(0.011)	(0.041)
Covariates	No	Yes	No	Yes	No	Yes
N	1372	1158	1387	1171	1362	1151
<i>Treatment Group 2 : Cues of Democratic Support</i>						
ATE	-0.031	-0.036	-0.028	-0.049	0.0130	-0.006
(SE)	(0.022)	(0.021)	(0.022)	(0.020)	(0.019)	(0.019)
<i>p</i> -value	0.161	0.084	0.212	0.015	0.498	0.741
Intercept	0.690	1.015	0.626	0.785	0.705	0.844
(SE)	(0.012)	(0.045)	(0.012)	(0.044)	(0.011)	(0.042)
Covariates	No	Yes	No	Yes	No	Yes
N	1350	1138	1370	1156	1344	1139
<i>Treatment Group 3 : Cues of Democratic Opposition</i>						
ATE	0.001	-0.004	-0.001	0.0002	0.019	0.015
(SE)	(0.022)	(0.021)	(0.022)	(0.019)	(0.019)	(0.018)
<i>p</i> -value	0.964	0.836	0.972	0.990	0.326	0.412
Intercept	0.690	1.031	0.626	0.812	0.705	0.913
(SE)	(0.012)	(0.044)	(0.012)	(0.044)	(0.011)	(0.042)
Covariates	No	Yes	No	Yes	No	Yes
N	1367	1160	1379	1173	1355	1155

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C2. The direct effects of treatments on preferences for policies (continued)

	Policy Preferences (2)					
	Universal healthcare program		Death penalty		Abortion rights	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Presidential Address</i>						
ATE	0.002	0.004	0.051	0.044	0.020	0.025
(SE)	(0.019)	(0.018)	(0.021)	(0.021)	(0.022)	(0.020)
<i>p-value</i>	<i>0.917</i>	<i>0.828</i>	<i>0.018</i>	<i>0.035</i>	<i>0.382</i>	<i>0.220</i>
Intercept	0.713	1.106	0.579	0.305	0.587	0.994
(SE)	(0.011)	(0.039)	(0.012)	(0.045)	(0.013)	(0.045)
Covariates	No	Yes	No	Yes	No	Yes
N	1376	1163	1339	1136	1357	1150
<i>Treatment Group 2 : Cues of Democratic Support</i>						
ATE	0.013	0.001	0.031	0.024	-0.002	-0.015
(SE)	(0.020)	(0.019)	(0.021)	(0.021)	(0.022)	(0.022)
<i>p-value</i>	<i>0.493</i>	<i>0.939</i>	<i>0.155</i>	<i>0.268</i>	<i>0.911</i>	<i>0.479</i>
Intercept	0.713	1.090	0.579	0.247	0.587	1.011
(SE)	(0.011)	(0.041)	(0.012)	(0.047)	(0.013)	(0.048)
Covariates	No	Yes	No	Yes	No	Yes
N	1364	1149	1311	1110	1332	1129
<i>Treatment Group 3 : Cues of Democratic Opposition</i>						
ATE	0.012	0.004	0.025	0.023	0.002	0.006
(SE)	(0.020)	(0.018)	(0.022)	(0.021)	(0.023)	(0.020)
<i>p-value</i>	<i>0.523</i>	<i>0.823</i>	<i>0.242</i>	<i>0.278</i>	<i>0.920</i>	<i>0.766</i>
Intercept	0.713	1.119	0.579	0.327	0.587	1.003
(SE)	(0.011)	(0.039)	(0.012)	(0.046)	(0.013)	(0.045)
Covariates	No	Yes	No	Yes	No	Yes
N	1379	1173	1338	1136	1357	1156

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p-values* are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C3. The heterogeneous effects of the presidential address on policy preferences

Heterogeneous Effects of Exposure to the Presidential Address								
across levels of :								
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	1.731	<i>0.188</i>	0.308	<i>0.579</i>	0.384	<i>0.535</i>	0.309	<i>0.578</i>
Gun control	0.961	<i>0.327</i>	1.010	<i>0.314</i>	0.814	<i>0.367</i>	3.337	<i>0.067</i>
Increase taxes for the rich	0.181	<i>0.670</i>	0.017	<i>0.894</i>	0.223	<i>0.636</i>	3.749	<i>0.053</i>
Universal healthcare program	0.032	<i>0.856</i>	2.055	<i>0.151</i>	0.433	<i>0.510</i>	3.067	<i>0.080</i>
Death penalty	1.887	<i>0.169</i>	0.473	<i>0.491</i>	0.020	<i>0.887</i>	0.0001	<i>0.980</i>
Abortion rights	0.257	<i>0.612</i>	0.268	<i>0.604</i>	0.025	<i>0.874</i>	0.283	<i>0.594</i>

**Note:** Entries are F-values. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C4. The heterogeneous effects of Democratic support for the presidential address on policy preferences

	Heterogeneous Effects of Exposure to Democratic Support for the Presidential Address across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.281	<i>0.596</i>	0.039	<i>0.843</i>	0.345	<i>0.557</i>	0.091	<i>0.762</i>
Gun control	0.868	<i>0.351</i>	0.571	<i>0.450</i>	0.732	<i>0.392</i>	0.095	<i>0.757</i>
Increase taxes for the rich	1.025	<i>0.311</i>	0.013	<i>0.906</i>	0.034	<i>0.852</i>	0.013	<i>0.909</i>
Universal healthcare program	0.261	<i>0.609</i>	1.999	<i>0.157</i>	1.946	<i>0.163</i>	0.797	<i>0.371</i>
Death penalty	1.187	<i>0.276</i>	<b>4.806</b>	<i>0.028</i>	<b>3.940</b>	<i>0.047</i>	0.464	<i>0.495</i>
Abortion rights	3.424	<i>0.064</i>	2.789	<i>0.095</i>	2.527	<i>0.112</i>	0.009	<i>0.921</i>

***Note:** Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.*



Table C5. The heterogeneous effects of Democratic opposition to the presidential address on policy preferences

	Heterogeneous Effects of Exposure to Democratic Opposition to the Presidential Address							
	across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.002	0.957	0.001	0.974	0.8234	0.364	0.493	0.482
Gun control	0.262	0.608	0.311	0.577	0.692	0.405	0.063	0.801
Increase taxes for the rich	2.106	0.146	1.564	0.211	0.332	0.564	1.607	0.205
Universal healthcare program	0.312	0.576	0.628	0.428	0.438	0.508	0.282	0.595
Death penalty	0.228	0.632	<b>5.091</b>	0.024	2.103	0.147	2.501	0.114
Abortion rights	1.468	0.225	0.078	0.779	0.001	0.970	0.180	0.671

**Note:** Entries are F-values. The *p*-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C6. Summary statistics of potential mediators

	Mean values of potential mediators			
	Placebo	Presidential Address	Democratic Support	Democratic Opposition
Patriotism	0.849 (0.222)	0.837 (0.237)	0.844 (0.239)	0.851 (0.225)
Nationalism	0.633 (0.264)	0.659 (0.264)	0.621 (0.262)	0.653 (0.273)
Internationalism	0.498 (0.286)	0.527 (0.284)	0.515 (0.285)	0.507 (0.305)
Symbolic Patriotism	0.791 (0.271)	0.782 (0.280)	0.782 (0.282)	0.802 (0.271)
Right-wing Authoritarianism	0.477 (0.214)	0.477 (0.206)	0.477 (0.208)	0.482 (0.213)

**Note:** Entries are mean values of baseline covariates and the respective standard deviations in parentheses. All variables are rescaled to range from 0 to 1.

Table C7. Alternative mechanisms: Treatment effects are not mediated by type of national attachment or right-wing authoritarian preferences

	Treatment effect on potential mediators					
	T <sub>PA</sub> – Placebo		T <sub>DS</sub> – Placebo		T <sub>DO</sub> – Placebo	
	Difference	p-value	Difference	p-value	Difference	p-value
Patriotism	0.012	0.362	0.005	0.697	-0.001	0.920
Nationalism	-0.026	0.102	0.012	0.443	-0.019	0.224
Internationalism	-0.028	0.095	-0.016	0.335	-0.009	0.610
Symbolic Patriotism	0.008	0.604	0.008	0.610	-0.011	0.480
Right-wing Authoritarianism	0.0006	0.961	-0.0001	0.991	-0.004	0.746

**Note:** T<sub>PA</sub> refers to the treatment of reading only the presidential address, T<sub>DS</sub> and T<sub>DO</sub> refer to the treatment of reading that Democrats support or oppose the presidential address, respectively. All variables are rescaled to range from 0 to 1.

## ***Chapter 2***

*The tables presenting the direct effects of treatments on general policy preferences are shown in the main body of the dissertation. Heterogeneous effects are shown in Appendix B (Tables B1-B6).*

### Chapter 3

Table C1. The direct effects of treatments on preferences for policies

	Policy Preferences (1)							
	Gay marriage		Gun control		Increase taxes for the rich		Universal healthcare program	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Conservative Christian Framing</i>								
ATE	-0.015	-0.012	0.014	0.026	0.007	0.009	-0.017	-0.001
(SE)	(0.022)	(0.021)	(0.020)	(0.018)	(0.018)	(0.017)	(0.021)	(0.019)
<i>p-value</i>	<i>0.474</i>	<i>0.559</i>	<i>0.495</i>	<i>0.167</i>	<i>0.393</i>	<i>0.570</i>	<i>0.419</i>	<i>0.977</i>
<u>Intercept</u>	0.652	0.989	0.659	0.750	0.714	0.841	0.669	0.952
(SE)	(0.012)	(0.055)	(0.011)	(0.049)	(0.010)	(0.049)	(0.011)	(0.051)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1426	1238	1443	1260	1405	1237	1413	1236
<i>Treatment Group 2 : Racial Justice Framing</i>								
ATE	-0.016	-0.014	0.002	0.004	0.026	0.026	0.003	0.003
(SE)	(0.022)	(0.020)	(0.020)	(0.019)	(0.017)	(0.017)	(0.020)	(0.018)
<i>p-value</i>	<i>0.443</i>	<i>0.491</i>	<i>0.135</i>	<i>0.817</i>	<i>0.147</i>	<i>0.130</i>	<i>0.850</i>	<i>0.178</i>
<u>Intercept</u>	0.652	0.943	0.659	0.815	0.714	0.889	0.669	0.858
(SE)	(0.012)	(0.056)	(0.011)	(0.050)	(0.010)	(0.049)	(0.011)	(0.051)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1444	1281	1462	1298	1425	1275	1424	1270
<i>Treatment Group 3 : Scientific Research Framing</i>								
ATE	0.007	0.003	-0.007	-0.005	0.003	0.006	-0.018	-0.012
(SE)	(0.022)	(0.020)	(0.020)	(0.018)	(0.018)	(0.017)	(0.020)	(0.019)
<i>p-value</i>	<i>0.736</i>	<i>0.885</i>	<i>0.708</i>	<i>0.752</i>	<i>0.842</i>	<i>0.702</i>	<i>0.375</i>	<i>0.515</i>
<u>Intercept</u>	0.652	0.957	0.659	0.813	0.714	0.876	0.669	0.953
(SE)	(0.012)	(0.058)	(0.011)	(0.049)	(0.010)	(0.049)	(0.011)	(0.051)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1440	1261	1444	1272	1418	1256	1415	1248

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C2. The direct effects of treatments on preferences for policies (continued)

	Policy Preferences (2)							
	Death penalty		Abortion rights		Deport immigrants		Shut down the borders	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Treatment Group 1 : Conservative Christian Framing</i>								
ATE	0.001	-0.009	-0.026	-0.024	-0.007	-0.018	-0.004	-0.011
(SE)	(0.021)	(0.021)	(0.023)	(0.021)	(0.020)	(0.019)	(0.021)	(0.019)
<i>p-value</i>	0.958	0.673	0.246	0.250	0.706	0.329	0.822	0.558
Intercept	0.598	0.270	0.572	0.928	0.403	0.329	0.540	0.092
(SE)	(0.012)	(0.053)	(0.012)	(0.056)	(0.011)	(0.049)	(0.012)	(0.050)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1365	1198	1401	1225	1404	1221	1394	1229
<i>Treatment Group 2 : Racial Justice Framing</i>								
ATE	0.020	0.027	-0.006	0.005	0.030	0.030	0.023	0.014
(SE)	(0.021)	(0.020)	(0.022)	(0.021)	(0.020)	(0.019)	(0.021)	(0.018)
<i>p-value</i>	0.928	0.189	0.782	0.794	0.130	0.104	0.275	0.423
Intercept	0.598	0.257	0.572	0.887	0.403	0.099	0.540	0.061
(SE)	(0.012)	(0.053)	(0.012)	(0.056)	(0.011)	(0.049)	(0.012)	(0.051)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1382	1238	1428	1271	1426	1267	1408	1263
<i>Treatment Group 3 : Scientific Research Framing</i>								
ATE	0.007	0.023	0.010	0.022	0.024	0.031	0.032	0.037
(SE)	(0.020)	(0.020)	(0.022)	(0.020)	(0.019)	(0.018)	(0.021)	(0.019)
<i>p-value</i>	0.725	0.256	0.644	0.277	0.221	0.099	0.118	0.052
Intercept	0.598	0.241	0.572	0.819	0.403	0.102	0.540	0.027
(SE)	(0.012)	(0.053)	(0.012)	(0.055)	(0.011)	(0.049)	(0.012)	(0.053)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1370	1216	1422	1250	1405	1241	1406	1247

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p-values* are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C3. The heterogeneous effects of conservative Christian framing on policy preferences

	Heterogeneous Effects of Exposure to Conservative Christian Framing across levels of:							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.080	<i>0.776</i>	2.385	<i>0.122</i>	0.464	<i>0.495</i>	0.354	<i>0.551</i>
Gun control	2.936	<i>0.086</i>	0.096	<i>0.755</i>	0.108	<i>0.742</i>	1.900	<i>0.168</i>
Increase taxes for the rich	1.266	<i>0.260</i>	0.696	<i>0.404</i>	0.113	<i>0.736</i>	0.127	<i>0.721</i>
Universal healthcare program	0.228	<i>0.632</i>	0.055	<i>0.814</i>	0.561	<i>0.453</i>	3.517	<i>0.060</i>
Death penalty	0.002	<i>0.959</i>	0.219	<i>0.639</i>	0.269	<i>0.604</i>	0.311	<i>0.576</i>
Abortion rights	0.709	<i>0.399</i>	0.066	<i>0.797</i>	1.142	<i>0.285</i>	0.958	<i>0.327</i>
Deport immigrants	0.213	<i>0.644</i>	0.196	<i>0.657</i>	0.918	<i>0.338</i>	0.147	<i>0.701</i>
Shut down the borders	0.125	<i>0.723</i>	0.002	<i>0.957</i>	0.010	<i>0.917</i>	0.453	<i>0.501</i>

*Note:* Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C4. The heterogeneous effects of racial justice framing on policy preferences

	Heterogeneous Effects of Exposure to Racial Justice Framing across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.001	<i>0.974</i>	0.073	<i>0.787</i>	0.589	<i>0.442</i>	0.721	<i>0.395</i>
Gun control	1.350	<i>0.245</i>	2.023	<i>0.155</i>	0.173	<i>0.677</i>	0.0001	<i>0.981</i>
Increase taxes for the rich	0.837	<i>0.360</i>	0.924	<i>0.336</i>	0.454	<i>0.500</i>	1.430	<i>0.231</i>
Universal healthcare program	0.355	<i>0.550</i>	0.186	<i>0.666</i>	0.392	<i>0.531</i>	0.005	<i>0.940</i>
Death penalty	2.373	<i>0.123</i>	0.711	<i>0.399</i>	0.001	<i>0.975</i>	0.303	<i>0.581</i>
Abortion rights	0.629	<i>0.427</i>	0.096	<i>0.756</i>	0.207	<i>0.648</i>	0.175	<i>0.675</i>
Deport immigrants	1.641	<i>0.200</i>	1.082	<i>0.298</i>	0.332	<i>0.564</i>	0.019	<i>0.888</i>
Shut down the borders	0.805	<i>0.369</i>	2.364	<i>0.124</i>	0.098	<i>0.753</i>	0.158	<i>0.691</i>

**Note:** Entries are F-values. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C5. The heterogeneous effects of scientific research framing on policy preferences

	Heterogeneous Effects of Exposure to Scientific Research Framing across levels of :							
	Political Awareness		Ideology		Partisan ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.419	<i>0.517</i>	0.901	<i>0.342</i>	1.090	<i>0.296</i>	0.386	<i>0.534</i>
Gun control	0.422	<i>0.516</i>	0.144	<i>0.704</i>	0.0003	<i>0.987</i>	0.307	<i>0.579</i>
Increase taxes for the rich	0.382	<i>0.536</i>	0.191	<i>0.661</i>	1.936	<i>0.164</i>	0.085	<i>0.769</i>
Universal healthcare program	0.589	<i>0.442</i>	0.096	<i>0.756</i>	0.155	<i>0.693</i>	<b>5.499</b>	<i>0.019</i>
Death penalty	1.309	<i>0.252</i>	0.002	<i>0.957</i>	0.155	<i>0.693</i>	2.926	<i>0.087</i>
Abortion rights	2.391	<i>0.122</i>	1.408	<i>0.235</i>	1.663	<i>0.197</i>	3.004	<i>0.083</i>
Deport immigrants	0.116	<i>0.733</i>	0.039	<i>0.841</i>	0.746	<i>0.387</i>	0.374	<i>0.540</i>
Shut down the borders	0.002	<i>0.962</i>	0.245	<i>0.620</i>	0.268	<i>0.604</i>	0.228	<i>0.632</i>

*Note:* Entries are F-values. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.



Table C6. The heterogeneous effects of treatments on policy preferences

	Heterogeneous Effects of Treatments across educational levels					
	Conservative Christian Framing		Racial Justice Framing		Scientific Research Framing	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.124	<i>0.724</i>	0.138	<i>0.710</i>	1.001	<i>0.317</i>
Gun control	1.730	<i>0.188</i>	0.712	<i>0.398</i>	0.022	<i>0.881</i>
Increase taxes for the rich	2.345	<i>0.125</i>	3.277	<i>0.070</i>	0.001	<i>0.970</i>
Universal healthcare program	1.839	<i>0.175</i>	0.076	<i>0.782</i>	0.185	<i>0.666</i>
Death penalty	0.156	<i>0.692</i>	1.273	<i>0.259</i>	0.870	<i>0.351</i>
Abortion rights	0.612	<i>0.434</i>	0.641	<i>0.423</i>	0.425	<i>0.514</i>
Deport immigrants	1.047	<i>0.306</i>	0.060	<i>0.806</i>	0.103	<i>0.747</i>
Shut down the borders	0.512	<i>0.474</i>	2.405	<i>0.121</i>	0.548	<i>0.459</i>

**Note:** Entries are *F*-values. The *p*-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C7. Summary statistics of outcomes in the placebo condition across levels of party identity

	Mean Values of Outcomes in the Placebo Condition among					
	Democrats		Independents		Republicans	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Global warming is a serious problem	0.898	<i>0.175</i>	0.774	<i>0.251</i>	0.619	<i>0.341</i>
Concerned about hurricane-related deaths	0.778	<i>0.225</i>	0.622	<i>0.267</i>	0.601	<i>0.315</i>
Economy vs. Environment	0.917	<i>0.275</i>	0.824	<i>0.381</i>	0.686	<i>0.464</i>
Long-term vs. short-term env. policies	0.500	<i>0.500</i>	0.437	<i>0.497</i>	0.371	<i>0.484</i>
Tax breaks to companies	0.804	<i>0.236</i>	0.737	<i>0.259</i>	0.692	<i>0.292</i>
Pollution tax to companies	0.868	<i>0.217</i>	0.778	<i>0.269</i>	0.660	<i>0.331</i>
Fund more green research	0.878	<i>0.187</i>	0.819	<i>0.228</i>	0.690	<i>0.303</i>
Financial relief to victims	0.876	<i>0.169</i>	0.786	<i>0.214</i>	0.732	<i>0.268</i>
Free housing to victims	0.840	<i>0.217</i>	0.764	<i>0.241</i>	0.692	<i>0.283</i>
Free healthcare to victims	0.864	<i>0.185</i>	0.762	<i>0.251</i>	0.665	<i>0.309</i>
Long-term Env. Policies (scale)	0.852	<i>0.170</i>	0.780	<i>0.199</i>	0.683	<i>0.271</i>
Short-term Relief Measures (scale)	0.864	<i>0.165</i>	0.775	<i>0.212</i>	0.698	<i>0.270</i>
Environmental Policies (scale)	0.855	<i>0.148</i>	0.774	<i>0.183</i>	0.688	<i>0.246</i>

**Note:** Entries are mean values of outcomes and the respective standard deviations. All variables are rescaled to range from 0 to 1.

Table C8. Table of balance test

	Balance on Baseline Covariates					
	Dem. – Ind.		Dem. – Rep.		Rep. – Ind.	
	Difference	<i>p-value</i>	Difference	<i>p-value</i>	Difference	<i>p-value</i>
Global warming is a serious problem	0.123	<0.001	0.278	<0.001	-0.154	<0.001
Concerned about hurricane-related deaths	0.155	<0.001	0.176	<0.001	-0.020	0.409
Economy vs. Environment	0.092	0.003	0.231	<0.001	-0.138	<0.001
Long-term vs. short-term env. policies	0.062	0.159	0.128	0.001	-0.065	0.146
Tax breaks to companies	0.067	0.001	0.111	<0.001	-0.044	0.063
Pollution tax to companies	0.089	<0.001	0.207	<0.001	-0.117	<0.001
Fund more green research	0.058	0.001	0.188	<0.001	-0.129	<0.001
Financial relief to victims	0.090	<0.001	0.143	<0.001	-0.053	0.009
Free housing to victims	0.075	<0.001	0.147	<0.001	-0.071	0.001
Free healthcare to victims	0.102	<0.001	0.198	<0.001	-0.096	<0.001
Long-term Env. Policies (scale)	0.072	<0.001	0.169	<0.001	-0.096	<0.001
Short-term Relief Measures (scale)	0.089	<0.001	0.165	<0.001	-0.076	<0.001
Environmental Policies (scale)	0.080	<0.001	0.167	<0.001	-0.086	<0.001

**Note:** Dem., Ind. Rep. refer to Democrats, Independents, and Republicans, respectively. All variables are rescaled to range from 0 to 1.

## Chapter 4

Table C1. The direct effects of memories of Hurricane Harvey on counter-terrorism attitudes

	Counter-terrorism Attitudes							
	Concerned about terrorism		Counter-terror. policies (scale)		Defensive counter-terror. policies (scale)		Confrontational counter-terror. policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>								
ATE	0.012	0.016	0.012	0.018	0.012	0.019	0.016	0.017
(SE)	(0.017)	(0.018)	(0.019)	(0.018)	(0.019)	(0.018)	(0.019)	(0.018)
<i>p-value</i>	<i>0.484</i>	<i>0.377</i>	<i>0.504</i>	<i>0.317</i>	<i>0.535</i>	<i>0.288</i>	<i>0.409</i>	<i>0.353</i>
Intercept	0.610	0.313	0.452	0.178	0.393	0.095	0.475	0.217
(SE)	(0.010)	(0.040)	(0.011)	(0.039)	(0.011)	(0.041)	(0.011)	(0.040)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1263	1021	871	737	1142	944	901	759

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C2. The direct effects of memories of Hurricane Harvey on preferences for counter-terrorism policies

	Counter-terrorism Policies (1)							
	Shut down the borders		Deport immigrants		Deport Muslims		Launch a drone strike in Iran	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>								
ATE	0.006	0.009	0.023	0.031	0.021	0.015	0.026	0.019
(SE)	(0.022)	(0.021)	(0.021)	(0.022)	(0.020)	(0.021)	(0.023)	(0.022)
<i>p-value</i>	<i>0.770</i>	<i>0.670</i>	<i>0.275</i>	<i>0.149</i>	<i>0.297</i>	<i>0.449</i>	<i>0.253</i>	<i>0.395</i>
Intercept	0.526	0.094	0.380	0.161	0.282	0.077	0.459	0.189
(SE)	(0.013)	(0.048)	(0.012)	(0.050)	(0.011)	(0.047)	(0.013)	(0.051)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1245	1014	1241	1012	1226	997	1049	866

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C3. The direct effects of memories of Hurricane Harvey attacks on preferences for counter-terrorism policies

	Counter-terrorism Policies (2)							
	Expand war on terrorism		Deploy troops in U.S. cities		Torture suspected terrorists		Censor social media	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>								
ATE	0.043	0.034	0.036	0.020	-0.015	-0.001	0.013	0.005
(SE)	(0.021)	(0.021)	(0.022)	(0.022)	(0.021)	(0.021)	(0.021)	(0.023)
<i>p-value</i>	<i>0.047</i>	<i>0.107</i>	<i>0.107</i>	<i>0.347</i>	<i>0.475</i>	<i>0.970</i>	<i>0.538</i>	<i>0.825</i>
Intercept	0.567	0.203	0.441	0.154	0.393	0.280	0.495	0.237
(SE)	(0.012)	(0.049)	(0.013)	(0.050)	(0.012)	(0.050)	(0.012)	(0.050)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1132	935	1187	979	1219	992	1203	985

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p-values* are based on a two-tailed test. When heteroskedasticity is present, HC1 robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C4. The heterogeneous effects of memories of Hurricane Harvey on preferences for counter-terrorism policies

	Heterogeneous Effects of memories of Hurricane Harvey across levels of :							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Concerned about terror.	0.211	<i>0.646</i>	0.018	<i>0.892</i>	0.0002	<i>0.987</i>	2.267	<i>0.132</i>
Shut down the borders	3.264	<i>0.071</i>	0.575	<i>0.448</i>	1.146	<i>0.284</i>	0.263	<i>0.607</i>
Deport Immigrants	0.636	<i>0.425</i>	0.013	<i>0.909</i>	0.079	<i>0.778</i>	1.052	<i>0.305</i>
Deport Muslims	0.534	<i>0.465</i>	2.417	<i>0.120</i>	1.333	<i>0.248</i>	3.716	<i>0.054</i>
Launch a drone strike	0.662	<i>0.416</i>	0.242	<i>0.622</i>	1.449	<i>0.228</i>	0.283	<i>0.594</i>
Expand war on terrorism	3.558	<i>0.059</i>	1.048	<i>0.306</i>	0.379	<i>0.538</i>	0.107	<i>0.743</i>
Deploy troops in U.S. cities	0.541	<i>0.461</i>	0.792	<i>0.373</i>	1.143	<i>0.285</i>	0.393	<i>0.530</i>
Torture suspected terror.	0.006	<i>0.938</i>	2.274	<i>0.131</i>	2.142	<i>0.143</i>	0.344	<i>0.557</i>
Censor social media	0.614	<i>0.433</i>	0.202	<i>0.653</i>	0.057	<i>0.810</i>	1.836	<i>0.175</i>
Defensive policies (sc.)	1.429	<i>0.232</i>	0.603	<i>0.437</i>	0.794	<i>0.372</i>	3.040	<i>0.081</i>
Confront. policies (sc.)	1.138	<i>0.286</i>	0.209	<i>0.647</i>	0.993	<i>0.319</i>	0.417	<i>0.518</i>
Counter-terr. Policies (sc.)	1.879	<i>0.170</i>	0.107	<i>0.743</i>	0.848	<i>0.357</i>	2.982	<i>0.084</i>

**Note:** Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C5. The direct effects of memories of the 9/11 terrorist attacks on environmental concerns

	Environmental Concerns			
	Global warming is a serious problem		Concerned that there will be another large flood	
	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>				
ATE	0.012	0.020	0.030	0.040
(SE)	(0.018)	(0.018)	(0.018)	(0.019)
<i>p-value</i>	<i>0.664</i>	<i>0.258</i>	<i>0.111</i>	<i>0.042</i>
Intercept	0.753	0.843	0.553	0.428
(SE)	(0.010)	(0.041)	(0.010)	(0.043)
Covariates	No	Yes	No	Yes
N	1263	1023	1233	1001

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p-values* are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.



Table C6. The direct effects of memories of the 9/11 terrorist attacks on environmental attitudes

	Environmental Attitudes					
	Economy vs. Environment		Long-term vs. Short-term Policies		Environmental Policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>						
ATE	0.001	0.001	-0.069	-0.044	-0.002	0.002
(SE)	(0.020)	(0.019)	(0.031)	(0.034)	(0.013)	(0.013)
<i>p-value</i>	<i>0.932</i>	<i>0.940</i>	<i>0.028</i>	<i>0.207</i>	<i>0.831</i>	<i>0.873</i>
Intercept	0.709	0.799	0.456	0.520	0.765	0.781
(SE)	(0.011)	(0.043)	(0.018)	(0.077)	(0.077)	(0.031)
Covariates	No	Yes	No	Yes	No	Yes
N	1176	967	1086	911	1112	926

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C7. The direct effects of memories of the 9/11 terrorist attacks for long-term environmental policies

	Long-term Environmental Policies							
	Tax breaks to companies		Pollution tax to companies		Fund more green research		Long-term environmental policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>								
ATE	-0.016	-0.028	-0.008	0.008	-0.005	-0.007	-0.009	-0.007
(SE)	(0.016)	(0.017)	(0.017)	(0.017)	(0.015)	(0.015)	(0.014)	(0.014)
<i>p-value</i>	<i>0.323</i>	<i>0.108</i>	<i>0.619</i>	<i>0.636</i>	<i>0.715</i>	<i>0.630</i>	<i>0.504</i>	<i>0.595</i>
Intercept	0.728	0.712	0.771	0.819	0.788	0.826	0.762	0.785
(SE)	(0.009)	(0.037)	(0.009)	(0.038)	(0.008)	(0.034)	(0.008)	(0.031)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1219	1002	1242	1015	1275	1039	1161	967

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HC1 robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C8. The direct effects of memories of the 9/11 terrorist attacks for short-term disaster relief measures

	Short-term Disaster Relief Measures							
	Financial relief to victims		Free housing to victims		Free healthcare to victims		Short-term environmental policies (scale)	
	(a)	(b)	(a)	(b)	(a)	(b)	(a)	(b)
<i>9/11 Attacks</i>								
ATE	0.010	0.010	0.016	0.014	0.013	0.016	0.015	0.016
(SE)	(0.014)	(0.015)	(0.015)	(0.016)	(0.016)	(0.016)	(0.014)	(0.014)
<i>p-value</i>	<i>0.473</i>	<i>0.501</i>	<i>0.306</i>	<i>0.375</i>	<i>0.424</i>	<i>0.333</i>	<i>0.292</i>	<i>0.269</i>
Intercept	0.797	0.799	0.756	0.777	0.765	0.808	0.775	0.794
(SE)	(0.008)	(0.032)	(0.009)	(0.037)	(0.009)	(0.036)	(0.008)	(0.034)
Covariates	No	Yes	No	Yes	No	Yes	No	Yes
N	1271	1025	1271	1021	1263	1021	1224	991

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HC1 robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C9. The heterogeneous effects of memories of the 9/11 terrorist attacks on preferences for environmental policies

	Heterogeneous Effects of memories of the 9/11 terrorist attacks across levels of :							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	p-value	F-value	p-value	F-value	p-value	F-value	p-value
Global warming is a serious problem	<b>4.894</b>	0.027	0.197	0.657	0.131	0.716	0.573	0.449
Concerned that hurricane-related deaths will increase	1.526	0.216	1.270	0.260	0.516	0.472	0.783	0.376
Economy vs. Environment	1.700	0.192	2.100	0.147	1.475	0.224	0.572	0.449
Long- vs. short-term policies	0.010	0.918	0	0.996	0.665	0.415	0.385	0.534
Tax breaks to companies	<b>4.213</b>	0.040	0.167	0.682	0	0.998	0.035	0.851
Pollution tax to companies	1.459	0.227	0.186	0.665	0.934	0.333	0.081	0.774
Fund more green research	3.308	0.069	1.437	0.230	0.248	0.618	0.065	0.798
Financial relief to victims	1.545	0.214	0.792	0.373	0.047	0.827	1.125	0.289
Free housing. to victims	0.219	0.639	2.551	0.110	0.344	0.557	1.174	0.278
Free healthcare to victims	0.640	0.423	3.012	0.082	0.007	0.932	0.439	0.507
Long-term policies (scale)	<b>5.417</b>	0.020	0.642	0.423	0.279	0.597	0.046	0.829
Short-term policies (scale)	0.267	0.605	2.422	0.119	0.031	0.859	1.321	0.250
Environmental policies (scale)	1.775	0.183	2.262	0.132	0.335	0.562	0.509	0.475

*Note:* Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C10. The direct effects of treatments on preferences for policies

	Policy Preferences (1)					
	Gay marriage		Gun control		Increase taxes for the rich	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>						
ATE	-0.003	0.011	-0.022	-0.006	0.021	0.016
(SE)	(0.022)	(0.021)	(0.022)	(0.021)	(0.018)	(0.019)
<i>p-value</i>	<i>0.863</i>	<i>0.576</i>	<i>0.311</i>	<i>0.782</i>	<i>0.249</i>	<i>0.382</i>
Intercept	0.690	1.043	0.657	0.773	0.723	0.847
(SE)	(0.012)	(0.047)	(0.012)	(0.048)	(0.011)	(0.044)
Covariates	No	Yes	No	Yes	No	Yes
N	1277	1032	1289	1048	1259	1031
<i>9/11 Attacks</i>						
ATE	-0.016	0.016	-0.002	0.021	-0.020	-0.025
(SE)	(0.023)	(0.021)	(0.022)	(0.021)	(0.020)	(0.020)
<i>p-value</i>	<i>0.466</i>	<i>0.438</i>	<i>0.905</i>	<i>0.331</i>	<i>0.317</i>	<i>0.219</i>
Intercept	0.690	0.986	0.657	0.787	0.723	0.820
(SE)	(0.013)	(0.047)	(0.012)	(0.047)	(0.011)	(0.044)
Covariates	No	Yes	No	Yes	No	Yes
N	1258	1013	1291	1046	1252	1030

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C11. The direct effects of treatments on preferences for policies

	Policy Preferences (2)					
	Universal healthcare program		Death penalty		Abortion rights	
	(a)	(b)	(a)	(b)	(a)	(b)
<i>Hurricane Harvey</i>						
ATE	-0.017	-0.012	0.006	-0.019	-0.0002	0.003
(SE)	(0.021)	(0.020)	(0.022)	(0.022)	(0.023)	(0.022)
<i>p-value</i>	<i>0.401</i>	<i>0.538</i>	<i>0.769</i>	<i>0.386</i>	<i>0.990</i>	<i>0.885</i>
Intercept	0.698	0.955	0.605	0.356	0.570	0.927
(SE)	(0.012)	(0.047)	(0.013)	(0.051)	(0.014)	(0.049)
Covariates	No	Yes	No	Yes	No	Yes
N	1278	1035	1233	1015	1271	1034
<i>9/11 Attacks</i>						
ATE	-0.004	-0.004	0.008	0.015	-0.022	-0.011
(SE)	(0.021)	(0.021)	(0.013)	(0.022)	(0.024)	(0.023)
<i>p-value</i>	<i>0.830</i>	<i>0.838</i>	<i>0.707</i>	<i>0.505</i>	<i>0.350</i>	<i>0.609</i>
Intercept	0.698	1.001	0.605	0.326	0.570	0.844
(SE)	(0.012)	(0.045)	(0.013)	(0.049)	(0.014)	(0.050)
Covariates	No	Yes	No	Yes	No	Yes
N	1270	1027	1215	1006	1258	1025

**Note:** Average Treatment Effects (ATE) are OLS coefficients. Difference-in-means models (a) do not control for any covariates. Covariate-adjusted models (b) control for sex, age, race, income, political awareness, trait authoritarianism, ideology, and party identity. The *p*-values are based on a two-tailed test. When heteroskedasticity is present, HCl robust standard errors are estimated. All variables are rescaled to range from 0 to 1.

Table C12. The heterogeneous effects of memories of Hurricane Harvey on policy Preferences

	Heterogeneous Effects of Memories of Hurricane Harvey across levels of :							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.649	<i>0.420</i>	0	<i>0.994</i>	0.544	<i>0.460</i>	0.179	<i>0.672</i>
Gun control	2.517	<i>0.112</i>	0.171	<i>0.678</i>	0.124	<i>0.724</i>	0.005	<i>0.939</i>
Increase taxes for the rich	0.426	<i>0.514</i>	0.082	<i>0.774</i>	0.008	<i>0.928</i>	0.496	<i>0.481</i>
Universal healthcare program	0.012	<i>0.911</i>	0.749	<i>0.386</i>	<b>4.702</b>	<i>0.030</i>	0.194	<i>0.659</i>
Death penalty	0.057	<i>0.810</i>	0.294	<i>0.587</i>	0.053	<i>0.817</i>	0.950	<i>0.329</i>
Abortion rights	2.860	<i>0.091</i>	2.034	<i>0.154</i>	0.013	<i>0.909</i>	0.027	<i>0.867</i>

*Note:* Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C13. The heterogeneous effects of memories of the 9/11 terrorist attacks on policy preferences

	Heterogeneous Effects of Memories of the 9/11 terrorist attacks across levels of :							
	Political Awareness		Ideology		Party ID		Trait Authoritarianism	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.869	0.351	0.173	0.677	1.194	0.274	0.013	0.908
Gun control	0.010	0.918	0.186	0.666	0.461	0.497	0.630	0.427
Increase taxes for the rich	1.575	0.209	0.394	0.530	0.022	0.879	0.125	0.723
Universal healthcare program	<b>6.491</b>	0.010	0.697	0.403	0.765	0.381	0.006	0.933
Death penalty	0.807	0.369	0.006	0.937	0.111	0.738	0.0004	0.983
Abortion rights	0.484	0.486	0.510	0.475	2.225	0.136	0.164	0.685

*Note:* Entries are F-values. The p-values are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.



Table C14. Heterogeneous treatment effects across age on policy preferences

	Heterogeneous Treatment Effects across Age (3)			
	Hurricane Harvey		9/11 Attacks	
	F-value	<i>p-value</i>	F-value	<i>p-value</i>
Gay marriage	0.426	<i>0.514</i>	1.479	<i>0.224</i>
Gun control	0.054	<i>0.816</i>	1.992	<i>0.158</i>
Increase taxes for the rich	2.008	<i>0.156</i>	1.594	<i>0.207</i>
Universal healthcare program	0.843	<i>0.358</i>	2.973	<i>0.084</i>
Death penalty	2.335	<i>0.126</i>	0.040	<i>0.840</i>
Abortion rights	0.077	<i>0.781</i>	0.008	<i>0.928</i>

*Note:* Entries are F-values. The *p-values* are based on a two-tailed test. Statistically significant heterogeneous effects (at the 0.05 level) are shown in bold.

Table C15. Summary statistics of potential mediators

	Mean values of potential mediators		
	Placebo	Hurricane Harvey	9/11 Attacks
Patriotism	0.799 (0.260)	0.795 (0.255)	0.798 (0.262)
Nationalism	0.616 (0.271)	0.603 (0.275)	0.619 (0.290)
Internationalism	0.525 (0.270)	0.515 (0.275)	0.537 (0.267)
Symbolic Patriotism	0.782 (0.277)	0.772 (0.265)	0.781 (0.289)
Right-wing Authoritarianism	0.511 (0.233)	0.525 (0.220)	0.528 (0.222)

**Note:** Entries are mean values of baseline covariates and the respective standard deviations in parentheses. All variables are rescaled to range from 0 to 1.

Table C16. Alternative mechanisms: Treatment effects are not mediated by type of national attachment or right-wing authoritarian preferences

	Treatment effect on potential mediators			
	$T_{HH} - \text{Placebo}$		$T_{911} - \text{Placebo}$	
	Difference	<i>p</i> -value	Difference	<i>p</i> -value
Patriotism	0.003	0.805	0.0009	0.952
Nationalism	0.012	0.469	-0.003	0.837
Internationalism	0.010	0.543	-0.011	0.489
Symbolic Patriotism	0.010	0.532	0.0009	0.954
Right-wing Authoritarianism	-0.014	0.345	-0.017	0.257

**Note:**  $T_{HH}$  refers to the treatment that primes subjects with memories of Hurricane Harvey and  $T_{911}$  refers to the treatment that primes subjects with memories of the 9/11 terrorist attacks. All variables are rescaled to range from 0 to 1.

## **Appendix D: Treatment materials for experimental studies**

### ***Chapter 1***

#### **Placebo: Oak Trees**

The following is an edited excerpt from an article published on sciencing.com. Please read it carefully. We will give you 2 minutes to do so.

“Oak trees are attractive hardwood trees generally known for their sturdy wood. Their botanical name, *Quercus*, means “beautiful tree.” Oak tree uses vary from timber and furniture to shade and medicine in nature.

One of the classic oak tree characteristics is the acorn. Acorns are the seeds of oak trees, and they tend to have caps. The nuts themselves can be rounded or pointy, depending on the type of species.

Oaks tend not to produce acorns until they are quite mature. The English oak produces acorns when it reaches 40 years of age. Northern red oaks produce acorns between 20 and 25 years of age.

Some oak varieties have distinctly lobed leaves. Red oaks have more pointed lobes and bristles, whereas white oaks have rounded lobes. White oaks can reach 100 feet in height.

The formations known as galls can be found on some oaks during summer and autumn. These galls hold insect eggs and protect larvae, while not harming the oaks.

You can find numerous types of oak trees around the world. In North America, some common species include northern red oak (*Quercus rubra*), white oak (*Quercus alba*) and coast live oak (*Quercus agrifolia*).

Other types of oak trees include overcup oak, sawtooth oak, scarlet oak, bur oak and pin oak among others. In England, English oak (*Quercus robur*) is the most common variety.

Northern red oaks are used for many commercial products such as fence posts, railroad ties, floors and cabinets. They are not typically used for barrels because of their porous quality.

White oaks are renowned for their highly durable wood, and they are prized for furniture, flooring and cabinets. White oaks make sturdy barrels and fence posts, as well as firewood.

English oaks make a very fine, hard timber used in furniture and architecture. They were used as ship-building material in the past.”

## **Treatment Group 1: Presidential Statement**

The following is a presidential statement that was leaked by a trusted anonymous source and has not been published yet. Please read it carefully. We will give you 2 minutes to do so.

“My fellow Americans,

Over the past weeks, our Intelligence Community has been receiving increasingly alarming signals that a series of major terrorist attacks are planned to be carried out in the next few days. It is believed that the terrorists are already on American soil but act in coordination with jihadi terrorist cells in Iran.

The Middle East has long been an Islamic powerhouse which breeds and shelters terrorists whose evil ideology and barbaric acts have killed tens of thousands of Americans here at home as well as throughout the world.

Jihadi terrorists have targeted our great country time and again. For decades, they have been the single most important danger for our lives, our values and our freedom.

Once again, terrorists think they can scare us into submission. The terrorists believe they can murder our neighbors, colleagues, friends, families and fellow citizens, and get away with it. This all ends tonight.

Civilization will not succumb to barbarism. America will triumph! Freedom shall prevail!

In the next few hours, my administration is going to release a detailed plan to fight terror at home and abroad. This strategy will allow us to defend our values and ourselves, and to eradicate the roots of Islamic barbarism. This is not a fight we picked, but we will fight it out proudly and with strong sense of justice.

My fellow Americans, my deepest thoughts are with all those whose lives are at risk. In these critical moments I sympathize and share your worries and the nation's.

Our country has always been the land of the brave and the free. Fear and failure have never been an option! It is this that makes us the greatest nation on earth and has helped us endure hardships and prevail throughout our history.

Thank you, all. God bless you, and may God bless the United States of America!"

Note: We reached out to the Democratic leadership for comment, but they reserve their official reactions until the President addresses the nation.

## **Treatment Group 2: Cues of Partisan Consensus**

The following is a presidential statement that was leaked by a trusted anonymous source and has not been published yet. Please read it carefully. We will give you 2 minutes to do so.

“My fellow Americans,

Over the past weeks, our Intelligence Community has been receiving increasingly alarming signals that a series of major terrorist attacks are planned to be carried out in the next few days. It is believed that the terrorists are already on American soil but act in coordination with jihadi terrorist cells in Iran.

The Middle East has long been an Islamic powerhouse which breeds and shelters terrorists whose evil ideology and barbaric acts have killed tens of thousands of Americans here at home as well as throughout the world.

Jihadi terrorists have targeted our great country time and again. For decades, they have been the single most important danger for our lives, our values and our freedom.

Once again, terrorists think they can scare us into submission. The terrorists believe they can murder our neighbors, colleagues, friends, families and fellow citizens, and get away with it. This all ends tonight.

Civilization will not succumb to barbarism. America will triumph! Freedom shall prevail!

In the next few hours, my administration is going to release a detailed plan to fight terror at home and abroad. This strategy will allow us to defend our values and ourselves, and to eradicate the roots of Islamic barbarism. This is not a fight we picked, but we will fight it out proudly and with strong sense of justice.

My fellow Americans, my deepest thoughts are with all those whose lives are at risk. In these critical moments I sympathize and share your worries and the nation's.

Our country has always been the land of the brave and the free. Fear and failure have never been an option! It is this that makes us the greatest nation on earth and has helped us endure hardships and prevail throughout our history.

Thank you, all. God bless you, and may God bless the United States of America!"

Note: We reached out to the Democratic leadership for comment and while they reserve their official reactions until the President addresses the nation, they expressed support for the President's initiatives to deal with the terrorist threat.



### **Treatment Group 3: Cues of Partisan Dissensus**

The following is a presidential statement that was leaked by a trusted anonymous source and has not been published yet. Please read it carefully. We will give you 2 minutes to do so.

“My fellow Americans,

Over the past weeks, our Intelligence Community has been receiving increasingly alarming signals that a series of major terrorist attacks are planned to be carried out in the next few days. It is believed that the terrorists are already on American soil but act in coordination with jihadi terrorist cells in Iran.

The Middle East has long been an Islamic powerhouse which breeds and shelters terrorists whose evil ideology and barbaric acts have killed tens of thousands of Americans here at home as well as throughout the world.

Jihadi terrorists have targeted our great country time and again. For decades, they have been the single most important danger for our lives, our values and our freedom.

Once again, terrorists think they can scare us into submission. The terrorists believe they can murder our neighbors, colleagues, friends, families and fellow citizens, and get away with it. This all ends tonight.

Civilization will not succumb to barbarism. America will triumph! Freedom shall prevail!

In the next few hours, my administration is going to release a detailed plan to fight terror at home and abroad. This strategy will allow us to defend our values and ourselves, and to eradicate the roots of Islamic barbarism. This is not a fight we picked, but we will fight it out proudly and with strong sense of justice.

My fellow Americans, my deepest thoughts are with all those whose lives are at risk. In these critical moments I sympathize and share your worries and the nation's.

Our country has always been the land of the brave and the free. Fear and failure have never been an option! It is this that makes us the greatest nation on earth and has helped us endure hardships and prevail throughout our history.

Thank you, all. God bless you, and may God bless the United States of America!"

Note: We reached out to the Democratic leadership for comment and while they reserve their official reactions until the President addresses the nation, they expressed their opposition to the President's initiatives to deal with the terrorist threat.

## ***Chapter 2***

### **A. News Articles**

#### **Placebo: Oak Trees**

#### **Oak trees historically important resource for those who lived below**

Mighty oaks from little acorns grow. The words of this 14th century proverb speak of the huge potential in small things.

*By Shannon M. Nass, special to the Post-Gazette*

Often referred to as the "king of trees," oaks play a vital ecological role wherever they grow. Acorns feed more than 100 species of wildlife, and the oak's massive frame, huge limbs and lush canopy shelter countless species of birds and mammals. For Native Americans and European settlers to North America, they were a reliable source of warmth, shelter and, most importantly, food.

"To me, it's kind of a fascinating story," said Patrick Adams, environmental education specialist at Raccoon Creek State Park. "It was a major food source that meant the difference between life and death for a lot of cultures."

Adams will lead a workshop, "Oaks: The Frame of Civilization," June 28 at Raccoon Creek State Park in Hookstown, Beaver County. Participants will learn the history and identification of oak trees, then process, cook and sample a variety of acorn-based foods.

According to Adams, acorns were the world's first staple crop and were prized for their nutritional value. They contain protein and fats, are high in calcium and other minerals, and are a good source of fiber.

Their abundance also contributed to their use as a major food source. A hike through many nearby forests is like walking on marbles, as acorns pebble forest paths.

Contrary to popular belief, said Robert Hansen, an educator in forest resources with Penn State Extension, squirrels and other wildlife do not have a large impact on the oak's propagation.

"If that were the case, I'd have red oaks all over," he said. "They are important, but it's not just the animal that spreads them."

Instead, he said their prevalence is influenced by their specific environment and the natural tendency of acorns to fall and roll. He noted that oak trees tend to flourish in drier climates with deep soil and adequate moisture.

There are approximately 60 species of oak trees native to the United States. In Western Pennsylvania, Hansen said, white and red oaks are common with red oaks being the most prevalent species.

A simple way to differentiate between white and red oaks is by the shape of their leaves. Red oaks have lobed leaves with sharply pointed tips. White oak leaves are similar in shape but have rounded or blunt tips.

They also can be identified by their bark, which Hansen said is preferable since it's visible year round. White oak bark is light gray to white and is scaly and marked with shallow fissures. Red oak bark is dark reddishgray-brown and scaly with broad, thin, rounded ridges.

Identification is important when harvesting acorns because white oak trees tend to have less tannic acid in their acorns than red oaks, Hansen said. Tannic acid gives acorns a bitter taste that can range from mild to unpalatable.

Acorns are safe to eat raw but can cause kidney damage if consumed in large quantities over time. To avoid this, Adams said as much tannic acid as possible needs to be removed by leaching the acorns with water. The process can be lengthy, but Adams said it is worth the effort.

Once the bitter tannins are gone, acorns have a sweet and mild taste. They can be eaten dried or roasted or coated with sugar to make candy. Most often, he said, they are finely ground into meal and used to make breads and cakes.

The best time to harvest acorns is right before they fall from the trees. Once on the ground, Hansen said acorns become susceptible to insect pests such as weevils. Another concern is food safety.

"It's like an apple that falls on the ground," he said. "After it hits that ground, you don't know what kind of bacteria can get on it, so generally you want to harvest things before they fall."

While their significance as a food source has diminished, oak wood is still prized for its use in furniture and flooring because of its appealing look and sturdy composition. It is also preferred for wine barrels, as it adds complexity to flavors.

No matter the use, Adams said oak trees have earned their designation as "mighty."

"It's generally accepted that phrase is in reference to the wood," he said, "but I kind of think it's more a combination of that and the fact that it was such a valuable food source for all of history until recently."

## **Treatment Group 1 and 2: Information about the Covid-19 pandemic**

The following is an article of an expert about the Coronavirus pandemic. Please read it carefully.

We will give you 2 minutes to do so.

### **Here's the Biggest Thing to Worry About With Coronavirus**

We don't have enough ventilators and I.C.U. beds if there's a significant surge of new cases. As with Italy, the health system could become overwhelmed.

*By Aaron E. Carroll, professor of pediatrics at Indiana University School of Medicine and the Regenstrief Institute.*

The ability of the American health care system to absorb a shock — what experts call surge capacity — is much weaker than many believe.

A crucial thing to understand about the coronavirus threat — and it's playing out grimly in Italy — is the difference between the total number of people who might get sick and the number who might get sick at the same time. Our country has only 2.8 hospital beds per 1,000 people. That's fewer than in Italy (3.2), China (4.3) and South Korea (12.3), all of which have had struggles. More important, there are only so many intensive care beds and ventilators.

It's estimated that we have about 45,000 intensive care unit beds in the United States. In a

moderate outbreak, about 200,000 Americans would need one.

A recent report from the Center for Health Security at Johns Hopkins estimated that there were about 160,000 ventilators available for patient care. That may seem like a lot, and under normal circumstances, it is. Pandemics, however, change the calculations.

A few years earlier, the same group modeled how many ventilators would be needed in unusual circumstances. In a pandemic akin to the flu pandemics in 1957 or 1968, about 65,000 people might need ventilation.

Hospitals don't survive financially in the United States by keeping beds open and equipment idle. They have enough equipment to be cost-effective, but still retain capacity to care for extra people in emergencies. But those emergencies do not account for what we are seeing now. It's very possible that many of the ventilators are being used right now for patients with other illnesses. They're also not mobile, and local outbreaks will quickly surpass the numbers of ventilators and respiratory therapists.

Moreover, if a pandemic more closely followed the model of the Spanish flu outbreak of 1918, we would need more than 740,000 ventilators.

Many people are comparing this virus to the flu. The thing to remember, though, is that the influenza numbers are spread out over eight months or more. They don't increase exponentially over the course of weeks, as the cases of Covid-19 are doing right now.



Further, a greater proportion of people who are becoming ill now are seriously sick. According to some estimates, 10 percent to 20 percent of those who are infected may require hospitalization. In a metropolitan setting, if enough people become infected, the numbers who may need significant care will easily overwhelm our capacity to provide it.

The cautionary tale is Italy. More than 12,000 people have been infected there; more than 800 have died. A little over 1,000 have recovered. Many of the rest are ill. And a significant number of them need to be hospitalized — right now.

This has exceeded Italy's capacity for care. It doesn't matter what physicians' specialties are — they're treating coronavirus. As health care providers fall ill, Italy is having trouble replacing them. Elective procedures have been canceled. People who need care for other reasons are having trouble finding space.

In an unthinkable fashion, physicians are having to ration care. They're having to choose whom to treat, and whom to ignore.

They're having to choose who will die.

Italy, especially Northern Italy, has a solid health care system. It might not be the best in the world, but it's certainly not lacking in ability. It's just not ready for the sudden influx of cases. There aren't enough physicians. There's not enough equipment.

The United States isn't better prepared.

Many health experts expect that a majority of people will eventually be exposed to, if not infected with, this virus. The total number of infected people isn't what scares many epidemiologists. It's how many are infected at the same time.

An unchecked pandemic will lead to an ever-quickenening rate of infection. If, however, we engage in social distancing, proper quarantining and proper hygiene, we can slow the rate of spread, and make sure there are enough resources to properly care for everyone. This can also buy us time for a vaccine to be developed.

We have no real idea how many people in the United States are infected. We're still woefully behind in testing.

Without quick action, what we're seeing in other countries may happen here, with terrible consequences.

## **B. Audiovisual clips**

**Apple-picking season in New York (Placebo):**

<https://www.youtube.com/watch?v=zdOunEJ9nO4>

**Clip about the Covid-19 pandemic:**

<https://www.youtube.com/watch?v=NW4veTNz8J0>

**Disgust-inducing clip:**

<https://www.youtube.com/watch?v=KCA-aNtEXFc>

## *Chapter 3*

### **A. News Articles**

#### **Placebo: Oak Trees**

#### **Oak trees historically important resource for those who lived below**

Mighty oaks from little acorns grow. The words of this 14th century proverb speak of the huge potential in small things.

*By Shannon M. Nass, special to the Post-Gazette*

Often referred to as the "king of trees," oaks play a vital ecological role wherever they grow. Acorns feed more than 100 species of wildlife, and the oak's massive frame, huge limbs and lush canopy shelter countless species of birds and mammals. For Native Americans and European settlers to North America, they were a reliable source of warmth, shelter and, most importantly, food.

"To me, it's kind of a fascinating story," said Patrick Adams, environmental education specialist at Raccoon Creek State Park. "It was a major food source that meant the difference between life and death for a lot of cultures."

Adams will lead a workshop, "Oaks: The Frame of Civilization," June 28 at Raccoon Creek State Park in Hookstown, Beaver County. Participants will learn the history and identification of oak trees, then process, cook and sample a variety of acorn-based foods.

According to Adams, acorns were the world's first staple crop and were prized for their nutritional value. They contain protein and fats, are high in calcium and other minerals, and are a good source of fiber.

Their abundance also contributed to their use as a major food source. A hike through many nearby forests is like walking on marbles, as acorns pebble forest paths.

Contrary to popular belief, said Robert Hansen, an educator in forest resources with Penn State Extension, squirrels and other wildlife do not have a large impact on the oak's propagation.

"If that were the case, I'd have red oaks all over," he said. "They are important, but it's not just the animal that spreads them."

Instead, he said their prevalence is influenced by their specific environment and the natural tendency of acorns to fall and roll. He noted that oak trees tend to flourish in drier climates with deep soil and adequate moisture.

There are approximately 60 species of oak trees native to the United States. In Western Pennsylvania, Hansen said, white and red oaks are common with red oaks being the most prevalent species.

A simple way to differentiate between white and red oaks is by the shape of their leaves. Red oaks have lobed leaves with sharply pointed tips. White oak leaves are similar in shape but have rounded or blunt tips.

They also can be identified by their bark, which Hansen said is preferable since it's visible year round. White oak bark is light gray to white and is scaly and marked with shallow fissures. Red oak bark is dark reddishgray-brown and scaly with broad, thin, rounded ridges.

Identification is important when harvesting acorns because white oak trees tend to have less tannic acid in their acorns than red oaks, Hansen said. Tannic acid gives acorns a bitter taste that can range from mild to unpalatable.

Acorns are safe to eat raw but can cause kidney damage if consumed in large quantities over time. To avoid this, Adams said as much tannic acid as possible needs to be removed by leaching the acorns with water. The process can be lengthy, but Adams said it is worth the effort.

Once the bitter tannins are gone, acorns have a sweet and mild taste. They can be eaten dried or roasted or coated with sugar to make candy. Most often, he said, they are finely ground into meal and used to make breads and cakes.

The best time to harvest acorns is right before they fall from the trees. Once on the ground, Hansen said acorns become susceptible to insect pests such as weevils. Another concern is food safety.

"It's like an apple that falls on the ground," he said. "After it hits that ground, you don't know what kind of bacteria can get on it, so generally you want to harvest things before they fall."

While their significance as a food source has diminished, oak wood is still prized for its use in furniture and flooring because of its appealing look and sturdy composition. It is also preferred for wine barrels, as it adds complexity to flavors.

No matter the use, Adams said oak trees have earned their designation as "mighty."

"It's generally accepted that phrase is in reference to the wood," he said, "but I kind of think it's more a combination of that and the fact that it was such a valuable food source for all of history until recently."

## **Treatment Group 1: Conservative Christian Frame**

### **I'm a Conservative Christian Environmentalist. No, That's Not an Oxymoron.**

The G.O.P. may have had a politically expedient change of heart. Better late than never.

*By Ericka Andersen, communications specialist for National Review and the Heritage Foundation*

It's been a long time coming, but some Republicans seem to have finally gotten serious about climate change. In June, a handful of senators rolled out a bipartisan climate change bill. It is co-sponsored by Debbie Stabenow, Democrat of Michigan, and Lindsey Graham, Republican of South Carolina.

The bill, the Growing Climate Solutions Act, makes it easier to pay farmers to capture carbon. It is the latest in a series of actions Republicans have taken in the past year to combat climate change.

In March, Kevin McCarthy, the House minority leader, unveiled the first in a series of three original proposals to help slow the earth's warming. The bills aim to help cut emissions by expanding a tax credit for carbon-capture technology and draw on federal funds for research and development.



With a growing majority of Americans concerned about the effects of climate change — 67 percent say the government isn't doing enough to combat it — Republicans may have had a politically expedient change of heart. Better late than never. The latest legislation offers the parties a common ground where meaningful change can flourish.

As a conservative Christian environmentalist, I've witnessed how the Republican base of Christian voters has helped push its leaders in this direction. The faith-based world is an overlooked source of activism for climate policy. When it comes to theology, a growing number of them are taking the Bible's Genesis call to care for Creation very seriously, and younger Christians increasingly seek policies that speak to this. Republicans have cultivated options that don't negate the conservative values they hold dear.

Mr. McCarthy's approach bypasses government mandates and regulations. Instead, it focuses on clean energy, carbon capture and conservation. Conservatives have historically opposed expensive, large-scale federal policy, but these innovative solutions provide tangible steps without sacrificing conservative principles. This is the Republican Party's bread and butter: creative concepts that don't require significant mandates or regulations to meet societal needs.

There is also an opportunity for new partnerships, both with younger Republicans and Christian communities engaged in the climate fight. Because about 80 percent of Republicans identify as Christian, political focus on climate policy will draw new interest from this characteristically passionate, activated group.

“By focusing on mobilizing Christians on this issue, other Christians will begin to see people like them engaging, and begin to recognize themselves in that movement,” said Kyle Meyaard-Schaap, a representative for Young Evangelicals for Climate Action, in a phone interview. Most churchgoing Christians view scripture as holy. Therefore, earthcare becomes a sacred act of worship. For the younger generation, environmental responsibility and combating climate change is both personal and spiritual.

“We, as Christians, have a responsibility to steward the earth we’ve been given, and we can’t do that without practical solutions,” Bethany Bowra, a conservative Christian in her 20s, wrote in an email. “God gave us a beautiful world that reflects Him at every turn, and my faith plays a role in the way I view our responsibility to engage on environmental issues.”

Young Evangelicals for Climate Action is just one of a growing number of faith-based organizations focused on the environment. Interfaith Power and Light exists to mobilize “a religious response to global warming,” and the Evangelical Environmental Network aims to “to be faithful stewards of God’s provision.”

Later this year, a Creation Care Prayer Breakfast, hosted by a group of evangelical environmental organizations, is scheduled to take place in Washington and feature a keynote address from Walter Kim, the president of the National Association of Evangelicals.

Not everyone is welcoming of the conservative plans for the environment. A writer at The New Republic called Mr. McCarthy’s approach “a package only a fossil fuel executive could love.”

The Sierra Club balked at a proposal from the Trump administration related to logging, denouncing it as “cynical exploitation” and “greenwashing.”

A purity standard on climate action may lead only to more gridlock. Progressive climate activists might consider the upside of these new Republican policies: They give environmentalists an “in” with churchgoers, who are a very powerfully activated demographic. And it’s something Joe Biden and his Democratic colleagues could work with if they take the presidency in November.

It might be difficult for progressives to believe in the environmental transformation of Republicans or the religious. Indeed, conservatives have generally shunned taking action on climate change. But that is changing. In 2019, Senator Graham said Republicans needed to “up our game” on climate change, and the party didn’t wait long to move on that.

Democrats have led the way on environmental policy issues before this, but it’s time for a longer table. Friends from the other side of the aisle are asking to join.

## **Treatment Group 2: Racial Justice Frame**

### **Climate change is also a racial justice problem**

What does racism mean for climate change — and vice versa?

*By Sarah Kaplan, climate reporter*

Normally, I use this column to respond to questions from readers about climate change. But — amid our ongoing national reckoning with racism prompted by the unequal impacts of the covid-19 pandemic, the recent killings of African Americans at the hands of police, and 400 years of history — this was the question on my mind.

If humanity is going to effectively tackle climate change, scientists and activists told me, it's a question we have to answer. You can't build a just and equitable society on a planet that's been destabilized by human activities, they argue. Nor can you stop the world from warming without the experience and the expertise of those most affected by it.

Racism is “inexorably” linked to climate change, said Penn State meteorologist Gregory Jenkins, because it dictates who benefits from activities that produce planet-warming gases and who suffers most from the consequences.

One study published last year in the Proceedings of the National Academies of Sciences found that black and Hispanic communities in the U.S. are exposed to far more air pollution than they produce through actions like driving and using electricity. By contrast, white Americans experience better air quality than the national average, even though their activities are the source of most pollutants. Another paper in the journal Science found that climate change will cause the most economic harm in the nation's poorest counties; many of those places, like Zavala County, Tex., and Wilkinson County, Miss., are home to mostly people of color.

In a course he teaches called "Climate Change, Climate Justice and Front Line Communities," Jenkins traces this connection from slavery, which created the economic foundation for the industrial revolution, to modern-day policies that influence where people live and environmental risks to which they are exposed. Studies show that coastal communities in the South, where African Americans are a significant fraction of the population, are at the greatest risk from sea level rise.

Other research has found that neighborhoods once shaped by discriminatory housing policies known as "redlining" have more pavement, fewer trees and higher average temperatures — a combination that can lead to deadly heat illness.

Racial inequality also means that the people most at risk from climate change have the fewest resources to cope. According to a study by the Joint Center for Political and Economic Studies, more than 30 percent of black New Orleans residents didn't own cars when Hurricane Katrina hit

— making it almost impossible for them to evacuate. After the storm, the city’s black population fell because many residents couldn’t afford to return.

“Unless inequity is addressed now,” Jenkins said, “future impacts from climate change will disable many communities of color.”

For Corina Newsome, a wildlife conservationist and climate activist at Georgia Southern University, the link between environmental issues and racial injustice is personal. Last year, the Philadelphia neighborhood where her family lives was rocked by an oil refinery explosion that discharged thousands of pounds of dangerous hydrofluoric acid into the atmosphere. In coastal Georgia, where she works, she witnessed how black communities are hardest hit by flooding, and how people who can’t afford air conditioning suffer the most in heat waves.

“These same exploits that are causing climate change on a massive scale ... are causing very immediate health problems in areas inhabited by black and brown people,” Newsome said. “You can’t afford to not care about it when you’re part of these marginalized communities.”

But she draws hope from the ways hard-hit communities are combating the problem, like the Savannah-based nonprofit Harambee House, which provides green job trainings and environmental health workshops in black neighborhoods.

Meanwhile, kids of color are spearheading America’s youth climate movement. A Washington Post-Kaiser Family Foundation poll in 2019 found that at least twice as many black and Hispanic

teens participated in school walkouts on climate change than their white counterparts; they were also more likely to say people need to take action in the next year or two.

“Climate change is the most immediate threat for the marginalized people of this country and of the world,” Newsome said. “But that also means we are the most quick to act.”

The world of climate activism has historically been dominated by white men, said Dorceta Taylor, an environmental sociologist at the University of Michigan who studies the history of the environmental movement. A 2014 study by the Green Diversity Initiative found that people of color made up about 12 percent of staff members and leadership at nongovernmental environmental organizations and foundations.

But those numbers are shifting. And with more diversity has come an increased focus on issues of environmental justice — something that has strengthened the movement by bringing “a kind of moral outrage to the conversation,” Taylor said.

“Seeing the incredible disproportionate impacts, the flooding, the heat,” she continued, “young people are saying, ‘That is wrong. We have to do something about it.’”

### **Treatment Group 3: Scientific Research Frame**

#### **Scientists have backed away from the worst-case climate scenario — and the best one too**

There's a range of possibilities for how much the earth will warm. A new study narrows the likely window by the largest margin in decades.

*By Umair Irfan, climate change reporter*

The basic mechanics of climate change are simple: Carbon dioxide in the atmosphere traps heat. More carbon dioxide means more heat is trapped across the Earth, causing it to warm up.

But scaled up over the entire planet, these physical processes interact in a myriad of complex and sometimes unexpected ways. The Arctic reflects sunlight back into space. Clouds in some circumstances trap heat, and in others, they cool the region beneath them. Forests store a big chunk of carbon, but they're being burned, cut down, and dying off from warming. The ocean soaks up a huge amount of heat and carbon dioxide, but it can't absorb it forever. And these effects are not all linear; some may taper off as the planet heats up while others may suddenly accelerate.

That's why scientists for decades have struggled to answer the basic question of how much the earth will eventually warm up for a given amount of carbon dioxide in the atmosphere.



The term for this parameter is equilibrium climate sensitivity. The classic way of framing it is asking what happens if we double the amount of carbon dioxide in the atmosphere compared to levels prior to the industrial revolution. Back in the 1800s, it was about 280 parts per million. Today, it's about 413 ppm. Some estimate it could reach 560 ppm as soon as 2050 without major mitigation steps.

A team of 25 scientists from around the world recently took a stab at answering the question of how sensitive the Earth's climate is to carbon dioxide and came up with range of possibilities. Their results, published July 22 in *Reviews of Geophysics*, showed that the planet would most likely warm on average between 4.7 degrees Fahrenheit and 7 degrees Fahrenheit (2.6 degrees Celsius and 3.9 degrees Celsius) if atmospheric carbon dioxide were to double.

This is still a wide span, but it's much smaller than prior estimated range of 2.7 and 9.1 degrees Fahrenheit (1.5 and 4.5 degrees Celsius) that had been the reigning benchmark for decades.

The new, narrower estimate for climate sensitivity has huge implications, not just for climate science, but for how humanity prepares for a warming world. It shows that the worst-case-scenario is not as dire as previously thought, but also that the best possibilities are still quite grim. In particular, it means that it will be almost impossible to hit the main target of the Paris climate agreement, limiting warming to less than 2 degrees Celsius (3.6 degrees Fahrenheit) this century, by chance; it will require aggressive action to reduce emissions with even less margin for delay.

Human action remains the greatest uncertainty for the global climate. While the new climate sensitivity estimate gives the world a clearer vision of the future, it is a future that can still be altered by our actions.

Indeed, the biggest factor shaping the future of the climate, and the greatest source of uncertainty, is what humans will do about it in the coming years. Power plants, farms, aircraft, trucks, buildings, deforestation, and other human-sources collectively spew carbon dioxide into the air at a rate of 2.6 million pounds per second, making humans the dominant source of changes in the climate over the past 50 years. And that rate is accelerating: More than half of all human greenhouse gas emissions occurred in just the last 30 years.

The question is how long this will continue and when the curve of carbon dioxide emissions will bend. However, like climate sensitivity, there has been some narrowing of what to expect in recent years. Current human greenhouse gas emissions are now much less likely to follow the most pessimistic trajectory, which assumes unchecked growth of fossil fuel combustion and little to no efforts to limit climate change.

The dirtiest sources of energy are now declining, and some parts of the world are making progress to cut emissions while others have signed onto aggressive targets. But emissions are still rising, and limiting climate change demands cutting them drastically, and soon.

A 2018 report from the IPCC examined what people would have to do to meet the more aggressive target under the Paris climate agreement, limiting warming to less than 1.5 degrees

Celsius. The report concluded that the world's greenhouse gas emissions need to be half of where they are now by 2030, zero by 2050, and thereafter emissions would actually have to be removed from the atmosphere to stabilize the climate.

That goal is almost certainly out of reach. The emissions gap between where the world is and where it needs to be is only getting wider.

And now with the latest estimate of climate sensitivity, the low-end estimate of climate sensitivity has gone up, meaning there's virtually no chance of staying below 2 degrees Celsius of warming if carbon dioxide concentrations reach 560 ppm. Even with the inherent uncertainties of these forecasts, these factors point toward a need for more concerted action to curb greenhouse gases.

“When it comes to climate, uncertainty is not our friend because the damages of climate change increase non-linearly,” explained Zeke Hausfather, director of climate and energy at the Breakthrough Institute. “Because there are some uncertainties, we are never really going to be able to get rid of, it really suggests we need to be cautious about our emissions.”

The problem of dangerous levels of global warming can still be solved, but the easiest options are off the table, and the longer we wait, the harder it gets.

## **B. Audiovisual clips**

### **Apple-picking season in New York (Placebo):**

<https://www.youtube.com/watch?v=zdOunEJ9nO4>

### **Hurricane Laura (Treatment)**

<https://www.youtube.com/watch?v=Gt6JQNBjpRY>

## *Chapter 4*

**Apple-picking season in New York (Placebo):**

<https://www.youtube.com/watch?v=zdOunEJ9nO4>

**Clip about Hurricane Harvey (Treatment group 1):**

<https://www.youtube.com/watch?v=ySwlQFdr5gU>

**Clip about the 9/11 attacks (Treatment group 2):**

<https://www.youtube.com/watch?v=UPB6Av4j2RA>



## Résumé

Le parallélisme de l'actualisation des opinions  
dans les contextes de menace :  
Effets de signalement, de cadrage, de mémoire et  
des émotions

Imaginez-vous assis autour de la table pour un repas de famille. Toute la famille est là pour célébrer une occasion spéciale. Vous portez vos beaux habits et vous êtes heureux de retrouver vos proches. Soudainement, votre vieil oncle commence à parler de la façon dont ce monde fou le rend stressé et confus. La famille autour de lui acquiesce et commence à discuter de toutes les choses terribles que 2020 a apportées, de la pandémie à la saison des ouragans extrêmement active et jusqu'aux dangers du terrorisme national et international. Certains ne sont pas d'accord sur la question la plus importante, d'autres sont complètement indifférents mais ils semblent tous exaspérés... Bientôt, la famille est divisée sur ce qui ne va pas et à qui c'est la faute. Les membres de la famille les plus jeunes et les plus progressistes se plaignent des déficiences systémiques qui mettent notre avenir en danger, tandis que les personnes plus âgées observent que le système actuel est la seule chose qui nous empêche de sombrer dans le chaos complet.

Vous voulez les aider à voir une lumière au bout du tunnel. Que devriez-vous faire ? Devriez-vous rester silencieux, les laisser terminer leur discussion et passer à un sujet plus agréable ? Devriez-vous exprimer votre opinion et offrir des preuves qui la soutiennent ? Cette conversation les amènera-t-elle à changer d'avis ou vont-ils tenir leur position plus fermement et devenir encore plus divisés ? La recherche présentée ici suggère qu'il vaut la peine de répondre de manière constructive aux arguments de votre famille., Ils n'abandonneront très probablement pas complètement leur point de vue mais, si vous utilisez soigneusement certaines techniques de persuasion, ils se déplaceront tous, en moyenne, un peu vers la direction des preuves que vous apportez indépendamment de leurs croyances générales.

Cette thèse présente un argumentaire approfondi sur la manière dont les citoyens actualisent leurs opinions politiques dans des contextes de menace. Je suggère que lorsque les citoyens sont exposés à de nouvelles informations, ils changent d'attitude de manière raisonnable, c'est-à-dire par petits incréments, dans le sens de l'information, et en parallèle (indépendamment



de leurs caractéristiques sociodémographiques). Les tentatives visant à persuader les citoyens sur une question de politique spécifique ont rarement un impact sur les attitudes envers les autres domaines politiques - mais des appels émotionnels forts peuvent être plus efficaces à cet égard que des informations factuelles. Dans l'ensemble, je soutiens, qu'en règle générale, les citoyens ordinaires sont assez prévisibles et peuvent présenter un biais minimal uniquement lorsque les messages contredisent directement leurs identités et valeurs politiques.

Cet argument contredit de nombreuses interprétations populaires de l'opinion publique, qui décrivent les individus comme étant mal informés, inattentifs et biaisés (Downs 1957 ; Hastorf et Cantril 1954). Pendant des décennies, les universitaires et les experts ont exprimé à plusieurs reprises leur inquiétude quant à savoir si les citoyens sont suffisamment compétents pour soutenir et faire progresser la démocratie libérale à travers un système de parti organisé et la compétition électorale (par exemple, Schumpeter 1943 ; Key 1964). Cette vision négative de l'opinion publique a été utilisée pour souligner le besoin d'élites et de leadership dans la politique démocratique et pour justifier leur rôle privilégié. Alors que des recherches récentes montrent que la capacité des élites à être impartiales peut être surestimée (par exemple, Broockman et Skovron 2018 ; Butler et Broockman 2011), cette thèse vise à fournir la preuve que la qualité des opinions du public est également systématiquement sous-estimée.

Pour analyser le changement d'attitude, j'applique une approche de psychologie politique à l'opinion publique et je mène quatre études expérimentales, qui comprennent onze interventions. Ces interventions identifient les effets des signaux de l'élite, des informations factuelles, des émotions incidentes, du cadrage idéologique et non idéologique, et de l'amorçage de la mémoire. De plus, j'étudie le changement d'attitude dans différents contextes caractérisés par un niveau élevé de menace. Dans de tels moments, la perception du risque par les citoyens augmente et ils réagissent avec une peur, une colère et un dégoût intenses (Lerner et Keltner 2001 ; Clifford et

Jerit 2018). Plus précisément, je me concentre sur trois types de menaces relativement exogènes : le terrorisme, la pandémie de Covid-19, le changement climatique et les catastrophes naturelles.

### *Aperçu des chapitres*

La thèse est organisée en quatre chapitres. Chaque chapitre est indépendant et le lecteur peut lire les chapitres dans n'importe quel ordre.

Le chapitre 1 examine l'effet des signaux partisans sur les attitudes à l'égard des politiques antiterroristes. Je tire parti de la crise de janvier 2020 entre les États-Unis et l'Iran pour tester si le fait d'exposer au hasard des individus à une déclaration présidentielle fictive sur une attaque terroriste imminente et des indices partisans soutenant ou s'opposant à cette déclaration affecte les préférences en matière de politiques antiterroristes. Je démontre que les citoyens actualisent leurs opinions dans la direction attendue et à peu près de la même manière, quel que soit leur degré de conscience politique, d'idéologie, d'identité de parti ou de trait d'autoritarisme.

Le chapitre 2 traite de l'impact du dégoût et des informations sur les attitudes à l'égard des politiques restrictives, de l'hygiène personnelle et des minorités asiatiques à la suite de la pandémie de Covid-19. L'exposition à l'information n'affecte les préférences que pour les politiques restrictives visant à lutter contre la propagation du virus. En revanche, l'effet autonome du dégoût incident, ainsi que son effet conjoint avec l'information, sont responsables du changement d'attitude envers les politiques à la fois pertinentes et non pertinentes en cas de pandémie, les minorités asiatiques et l'hygiène personnelle. De plus, les citoyens réagissent parallèlement aux informations et aux stimuli du dégoût à tous les niveaux de conscience politique, d'idéologie, d'affiliation partisane et de trait d'autoritarisme.

Le chapitre 3 se concentre sur l'effet du cadrage idéologique et non idéologique sur les opinions relatives aux changements climatiques et aux catastrophes naturelles. Dans une expérience d'enquête menée pendant la saison cyclonique 2020 dans l'océan Atlantique nord, j'étudie si l'exposition aléatoire d'individus à des cadres idéologiques et non idéologiques du changement climatique affecte les préférences pour les politiques environnementales à long terme et les mesures de secours en cas de catastrophe. Les résultats suggèrent que pour que les messages environnementaux soient convaincants, ils doivent être formulés d'une manière qui, au minimum, ne menace pas les valeurs conservatrices. Cependant, lorsque les messages sont convaincants, les citoyens actualisent leurs opinions en parallèle et indépendamment de leur degré d'éducation, de conscience politique ou de prédispositions politiques.

Enfin, le chapitre 4 analyse l'effet des souvenirs collectifs des menaces passées sur les attitudes du public face aux défis actuels. Je mène une vaste expérience d'enquête pour tester si la stimulation aléatoire des souvenirs de l'ouragan Harvey et des attentats terroristes du 11 septembre 2001 affecte les préférences pour les politiques environnementales et antiterroristes, respectivement. En effet, je trouve que les citoyens animés par une mémoire collective accroissent leur soutien à l'environnementalisme et à la lutte contre le terrorisme dans le même sens, quels que soient leur âge ou leurs attributs politiques. Cependant, l'impact des mémoires collectives est plus important dans le cas de l'ouragan Harvey que des attentats du 11 septembre 2001.

Ensemble, les conclusions de ces chapitres soutiennent systématiquement que les citoyens changent d'avis par petits incréments, en fonction des preuves qu'ils reçoivent, et indépendamment de leurs caractéristiques sociodémographiques. Le corps principal de la thèse présente les parties de l'analyse qui sont les plus centrales de l'argument que je propose. En effet, chaque chapitre ne présente que les résultats des effets directs des traitements sur les résultats d'intérêt et les tableaux

respectifs. En raison de leur grande longueur, les analyses sur les effets indirects, hétérogènes et de retombées se trouvent dans les annexes.

### *Le parallélisme de l'actualisation : une évaluation comparative des quatre études de cas*

Ensemble, les résultats des quatre études présentées dans cette thèse illustrent la force analytique du principe de l'actualisation en parallèle pour expliquer les modèles de changement d'attitude (pour un aperçu des études et de leurs résultats, voir les tableaux 5.1 et 5.2). Conformément aux attentes issues de la thèse des publics parallèles (Page et Shapiro 1992) et du modèle d'apprentissage bayésien (Hill 2017; Coppock, Hill, et Vavreck 2020), le changement d'attitude est faible, se produit dans le sens de l'information et présente peu d'hétérogénéité. Je trouve que les citoyens actualisent leurs positions sur les enjeux en marge de leurs dispositions politiques mais ces dispositions n'affectent pas la direction ou l'ampleur de leur changement d'attitude. Cela implique que l'opinion publique est relativement stable et ne fluctue pas de façon spectaculaire. Étant donné que je n'examine que l'impact d'une information supplémentaire sur les opinions politiques, l'existence d'effets importants dus à une exposition répétée à des flux d'informations coordonnés, uniformes et cohérents ne peut être exclue.

À travers 1153 spécifications de modèles, je fournis des preuves solides que le changement d'attitude est plus ou moins homogène. Dans les rares cas où des effets hétérogènes sont constatés, ils se produisent en raison d'effets de plafond et sont incompatibles avec les prédictions selon lesquelles les individus sont portés à confirmer leurs croyances antérieures (chapitres 1 et 3). Le changement d'attitude est similaire pour tous les types de messages, qu'ils soient textuels (chapitres 1-3) ou audiovisuels (chapitres 2-4), spécifiques à une question (chapitres 1-4) ou généraux (chapitre 2), explicitement persuasifs (chapitres 1-3) ou non (chapitres 2 et 4). De plus, les effets

des interventions présentent peu d'hétérogénéité quelles que soient les caractéristiques de l'expéditeur (élites partisans (chapitre 1), les médias (chapitres 2 et 3) ou inconnus (chapitres 2 et 4), et les caractéristiques du récepteur (degrés de conscience politique, d'idéologie, d'identité de parti, de trait d'autoritarisme (chapitres 1-4), d'éducation (chapitre 3) ou d'âge (chapitre 4). Néanmoins, mon analyse n'exclut pas la possibilité qu'il existe d'autres sources d'hétérogénéité que je n'ai pas étudiées.

De plus, je trouve que les effets secondaires sont rares. Des effets secondaires sont observées lorsque des changements dans une attitude entraînent des changements dans d'autres attitudes. Dans les chapitres 1, 3 et 4, les traitements qui identifient les préférences pour les politiques environnementales et antiterroristes n'ont aucun effet en aval sur les attitudes qui ne sont pas liées à ces domaines politiques, même si elles ne sont pas totalement hors de propos. Les effets secondaires sont absents lorsque le message est partisan et a l'intention de persuader les gens de changer d'avis (chapitres 1 et 3), lorsqu'il est non partisan et explicitement persuasif (chapitres 2 et 3), lorsqu'il transmet beaucoup d'informations factuelles (chapitre 3), ou lorsqu'il est non partisan et non explicitement persuasif (chapitre 4).

En revanche, je n'observe des effets secondaires que lorsque l'intervention est à la fois forte et fait appel à des émotions (chapitre 2). Cette constatation nuance davantage les attentes théoriques de Brandt et Sleegers (sous presse), qui proposent que les effets d'entraînement peuvent être mesurables si l'intervention est intense. Ce n'est pas nécessairement la force des interventions qui génère des retombées mais leur contenu. Les effets secondaires ne sont détectées que lorsque les interventions sont fortes et ciblent des émotions non politiques (chapitre 2), pas lorsque des émotions non politiques sont combinées avec des informations politiques (chapitre 2), ou lorsqu'elles sont riches en faits et en détails sur un domaine politique (chapitre 3). Cela résonne avec les attentes du modèle RAS (Recevoir-Accepter-Echantillonner) qui postule que « les

individus répondent aux questions de l'enquête en faisant la moyenne des considérations qui leur sont immédiatement saillantes ou accessibles » (Zaller 1992, 49). Par conséquent, stimuler des émotions incidentes, sans amener directement les individus à avoir des considérations politiques, peut affecter un plus grand répertoire d'attitudes que de fournir des informations factuelles détaillées sur un domaine politique.

Bien qu'en général les individus soient assez raisonnables, les diverses pressions basées sur le groupe et sur l'attitude peuvent inciter à un biais idéologique limité. Dans le chapitre 1, je trouve que les individus réagissent à la déclaration présidentielle en augmentant leurs préférences pour les politiques antiterroristes, que leur parti y soit ou non favorable. Néanmoins, lorsque les républicains et les autoritaires, mais pas les démocrates, constatent qu'il existe un consensus de l'élite sur la façon de faire face à cette menace, ils ont tendance à résister au message. Cette asymétrie conservatrice est encore plus remarquable dans le chapitre 3, où je montre que les républicains ne mettent pas à jour leurs opinions sur l'environnementalisme, lorsque le changement climatique est présenté comme une question d'injustice raciale. Contrairement aux républicains, les démocrates augmentent leur demande de politiques environnementales même si le message est formulé en termes conservateurs.

### *Implications plus générales*

Cette thèse peut éclairer l'élaboration des politiques et des stratégies de communication politique de plusieurs manières. Dans l'ensemble, les résultats suggèrent qu'il devrait y avoir un optimisme prudent quant à la capacité des citoyens à se forger des opinions compréhensibles et à les actualiser de manière prévisible. D'un point de vue normatif, c'est une bonne nouvelle pour la théorie démocratique car les citoyens sont suffisamment équipés pour influencer les politiques et

imposer une contrainte démocratique aux élites. L'opinion publique n'est pas imparfaite ou capricieuse, et les élites devraient donc prendre ses demandes au sérieux et gérer l'élaboration de politiques de manière responsable. Si les politiciens ignorent ces demandes ou ne fournissent pas de politiques adéquates, le public américain semble avoir les qualités nécessaires pour tenir les dirigeants pour responsables. En d'autres termes, les défis actuels de la démocratie américaine peuvent être abordés avec plus de démocratie et de délibération, pas moins (Fishkin et Luskin 2005).

À l'inverse, les élites doivent être convaincues que, si leurs messages parviennent aux citoyens, l'opinion publique moyenne y répondra raisonnablement. Les politiciens et les stratèges de la communication politique peuvent prévoir que leurs publicités de campagne seront comprises de manière plus ou moins précise par tous les segments du public et déplaceront légèrement l'opinion publique dans la même direction. Surtout, il est peu probable que les effets de contrecoup, c'est-à-dire l'actualisation dans le sens opposé de l'information, représentent une menace grave pour la communication. Par conséquent, les élites ne devraient ni surestimer leur capacité à changer les gens d'avis, ni sous-estimer la capacité des gens à se renseigner sur la politique et forger leurs opinions.

Cependant, les leaders d'opinion devraient prendre en compte plusieurs mises en garde. L'opinion publique fait preuve de peu de contraintes dynamiques, c'est-à-dire que l'actualisation des vues sur une question politique spécifique n'entraîne pas l'actualisation des vues sur d'autres questions plus ou moins étroitement liées. Cela suggère que les stratèges de la communication politique devraient investir du temps, des efforts et des fonds dans des campagnes de publicité et d'information qui se concentrent sur des questions spécifiques, sans espérer qu'une meilleure connaissance d'un certain domaine politique aura un impact sur les préférences pour d'autres domaines politiques. Leur travail est encore compliqué par la nécessité d'inclure toutes ces

propositions politiques dans un agenda politique cohérent et uniforme. En d'autres termes, il ne suffit pas d'expliquer pourquoi les gens devraient soutenir un ensemble diversifié de politiques, mais de souligner quelle politique va avec quoi. L'élaboration d'un programme et d'un discours politique qui relie de manière significative une multitude de questions politiques peut s'avérer être un défi exigeant qui dépasse les horizons cognitifs et la capacité d'attention des citoyens ordinaires. Peut-être qu'une stratégie plus rentable consisterait à identifier un ensemble limité de demandes économiques et non économiques fondamentales qui sont saillantes pour le public et à proposer des politiques globales et audacieuses qui les satisfont en tandem.

Les appels émotionnels peuvent aider à cet égard car ils génèrent des effets profonds qui vont au-delà de problèmes spécifiques. Bien que les émotions soient généralement considérées comme des facteurs déstabilisants et irrationnels qui diminuent la qualité du débat public, une riche littérature documente également le rôle positif des émotions en politique (par exemple, Marcus, Neuman, et MacKuen 2000; Valentino et al. 2008; Sniderman, Brody, et Tetlock 1993). Cette thèse fournit la preuve que les émotions fonctionnent comme un ciment qui maintient ensemble des attitudes et des opinions indépendantes. L'activation des réponses émotionnelles peut renforcer la contrainte idéologique et faciliter une compréhension plus globale de ce que sont les enjeux politiques pendant les périodes critiques. Un côté plus sombre des émotions stimulantes est le « dog whistling » (à double sens). Comme indiqué dans le chapitre 2, les appels émotionnels peuvent stimuler des instincts antisociaux et créer des divisions sur la base de la race, du sexe, de la classe sociale et d'autres identités sociales. Au cours de la pandémie, la minorité asiatique a été prise pour cible à plusieurs reprises en raison d'accusations factuellement infondées mais actives sur le plan émotionnel.

Une autre stratégie pour coordonner le changement d'attitude et augmenter la force de persuasion des messages est le contre-cadrage. Le contre-cadrage décrit le cadrage de questions



litigieuses et polarisées en s'appuyant sur des valeurs et des identités politiques qui résonnent avec le groupe cible. Dans le chapitre 3, je montre que cette stratégie est plus efficace que la simple diffusion d'informations scientifiques sur le changement climatique. Le contre-cadrage augmente la pression exercée sur les individus pour qu'ils réconcilient leurs préférences pour des politiques qui sont normalement considérées comme incompatibles avec leur vision du monde, avec des valeurs et des identités qui sont au cœur de leurs systèmes de croyances. Cela peut conduire les sceptiques à devenir plus favorables aux politiques auxquelles ils s'opposent en principe.

Enfin, le public reste raisonnable même dans des contextes de menace. Les entrepreneurs politiques et les stratèges de la communication ne doivent pas faire l'erreur de penser que leur marge de manœuvre pour manipuler l'opinion publique est illimitée dans les périodes critiques. À travers quatre études, je démontre que le changement d'attitude dans des périodes troublées suit les mêmes schémas prévisibles que dans des circonstances normales (Page et Shapiro 1992; Coppock 2016). Les citoyens semblent être capables d'absorber les informations et d'y réagir de manière compréhensible, même lorsqu'ils exercent leurs fonctions dans des situations qui stimulent le stress émotionnel et activent des mécanismes d'adaptation cognitifs et affectifs pour faire face aux menaces. Les leaders politiques et d'opinion devraient apprécier les qualités bénéfiques du public et répondre à ses préoccupations et à ses demandes avec un sens des responsabilités.

#### *Pistes de recherches futures*

Cette thèse n'offre pas et ne peut pas offrir un compte rendu exhaustif et gravé dans le marbre de la manière dont les citoyens actualisent leurs points de vue. Au contraire, la crédibilité de ses conclusions repose sur de futures répliques. J'invite les chercheurs à reproduire ce travail à la fois directement et conceptuellement afin de tester si les résultats restent sensiblement les

mêmes lorsque les expériences sont menées avec différents traitements, avec différents échantillons et indicateurs, et dans différents pays et contextes. Bien que cette thèse soit le fruit d'un travail minutieux et éthique, sa qualité ne peut être appréciée qu'à la lumière des études futures qui valideront, prolongeront ou rejeteront ses contributions.

Je pense que le travail présenté ici peut servir de tremplin pour explorer davantage l'interaction entre l'opinion publique et le comportement politique. Les spécialistes de l'opinion publique concentrent généralement leur analyse sur la manière dont les individus ou les groupes forment leurs opinions, les organisent et les modifient à la lumière de nouvelles informations, mais ils font rarement le pas supplémentaire pour étudier comment ces opinions se traduisent en comportement. Par conséquent, il n'y a qu'un nombre limité d'enquêtes sur la façon dont les interventions comportementales modifient les opinions ou, à l'inverse, comment l'exposition à l'information entraîne des changements de comportement. Pour que les politologues et les spécialistes des sciences sociales remplissent leur mission sociale et offrent des solutions pratiques aux problèmes du monde réel, ces barrières artificielles doivent être supprimées, afin qu'ils puissent fournir à leur place une compréhension plus complète des qualités et des limites qui caractérisent à la fois les attitudes et comportement des citoyens des démocraties libérales modernes.